ORDER NO. KMF0007425C3

Service Manual

Facsimile with Telephone Answering System

KX-FT68BR

(BRAZIL)

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⚠ WARNING

This service information is designed for experienced repair technicians only and is not designed for use by the general public.
It does not contain warnings or cautions to advise non-technical individuals of potential dangers in attempting to service a product.
Products powered by electricity should be serviced or repaired only by experienced professional technicians. Any attempt to service or repair the product or products dealt with in this service information by anyone else could result in serious injury or death.

Panasonic

1. TRANSLATION LIST (ENGLISH,PORTUGUESE)

1.1. LCD MASSAGES

ENGLISH	Portuguese														
CHECK MEMORY	V	E	R	I	F	I	Q	U	E		M	E	N	.	
CHECK DOCUMENT	V	E	R	I	F	I	Q	U	E		D	O	C	.	
REMOVE DOCUMENT	R	E	M	O	V	A		A		F	O	L	H	A	
UNIT OVERHEATED	S	U	P	E	R	A	Q	U	E	C	I	D	O		
PAPER JAMMED	P	A	P	E	L		E	N	R	O	S	C	A	D	O
CALL SERVICE	C	H	A	M	A	R		T	E	C	N	I	C	O	
CALL SERVICE2	C	H	A	M	A	R		T	E	C	N	I	C	O	2
REDIAL TIME OUT	F	I	M	/	R	E	D	I	S	C	A	G	E	M	
TRANSMIT ERROR	E	R	R	O		D	E		T	R	A	N	S	M	.
POLLING ERROR	E	R	R	O		P	O	L	L	I	N	G			
FAX IN MEMORY	D	O	C	.		N	A		M	E	M	**Ó**	R	I	A
MEMORY FULL	M	E	M	**Ó**	R	I	A		C	H	E	I	A		
NO TAD GREETING	S	E	M		M	E	N	S	.	S	E	C	.		
USER STOPPED			I	N	T	E	R	R	U	P	**Ç**	**Ã**	O		
EASY DIAL	**E**	**A**	**S**	**Y**		**D**	**I**	**A**	**L**						
1.SYSTEM SET UP	P	R	O	G	R	A	M	A	**Ç**	**Ã**	O				
SETUP ITEM [ ]	P	R	O	G	.		I	T	E	M		[			]
YOUR LOGO	S	E	U		L	O	G	O	T	I	P	O			
NO TRNS-GREETING	S	E	M		M	E	N	S	.	T	R	A	N	S	F
CHECK COVER			F	E	C	H	A	R		T	A	M	P	A	
OUT OF PAPER			A	C	A	B	O	U		P	A	P	E	L	
DIRECTORY FULL	D	I	R	E	T	O	R	I	O		C	H	E	I	O
NO RESPONSE	N	**Ã**	O		R	E	S	P	O	N	D	E			

2. INTRODUCTION

2.1. SAFETY PRECAUTIONS

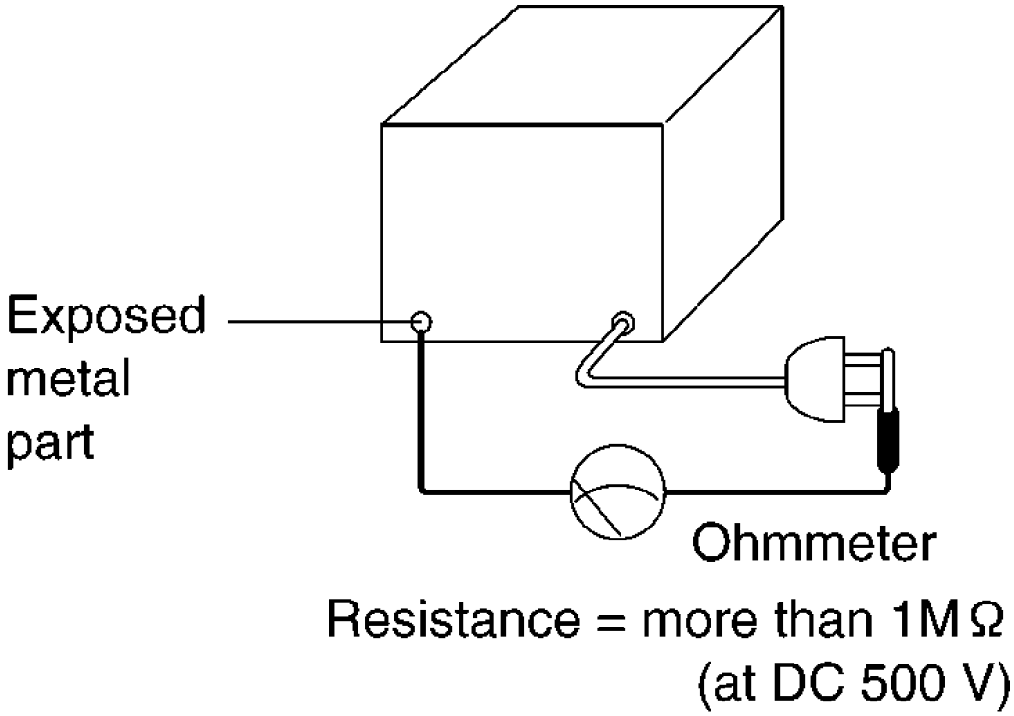
1. **Before servicing, unplug the AC power cord to prevent an electric shock.**
2. **When replacing parts, use only the manufacturer's recommended components.**
3. **Check the condition of the power cord. Replace if wear or damage is evident.**
4. **After servicing, be sure to restore the lead dress, insulation**

barriers, insulation papers, shields, etc.

5. **Before returning the serviced equipment to the customer, be sure to perform the following insulation resistance test to prevent the customer from being exposed to shock hazards.**

2.2. INSULATION RESISTANCE TEST

1. **Unplug the power cord and short the two prongs of the plug with a jumper wire.**
2. **Turn on the power switch.**
3. **Measure the resistance value with an ohmmeter between the jumpered AC plug and each exposed metal cabinet part (screw heads, control shafts, bottom frame, etc.).**
   Note: Some exposed parts may be isolated from the chassis by design. These will read infinity.
4. **If the measurement is outside the specified limits, there is a possibility of a shock hazard. / The equipment should be repaired and rechecked before it is returned to the customer.**



2.3. FOR SERVICE TECHNICIANS

ICs and LSIs are vulnerable to static electricity. / When repairing, the following precautions will help prevent recurring malfunctions.

1. Cover the plastic part's boxes with aluminum foil.
2. Ground the soldering irons.
3. Use a conductive mat on the worktable.
4. Do not touch the IC or LSI pins with bare fingers.

2.4. BATTERY CAUTION

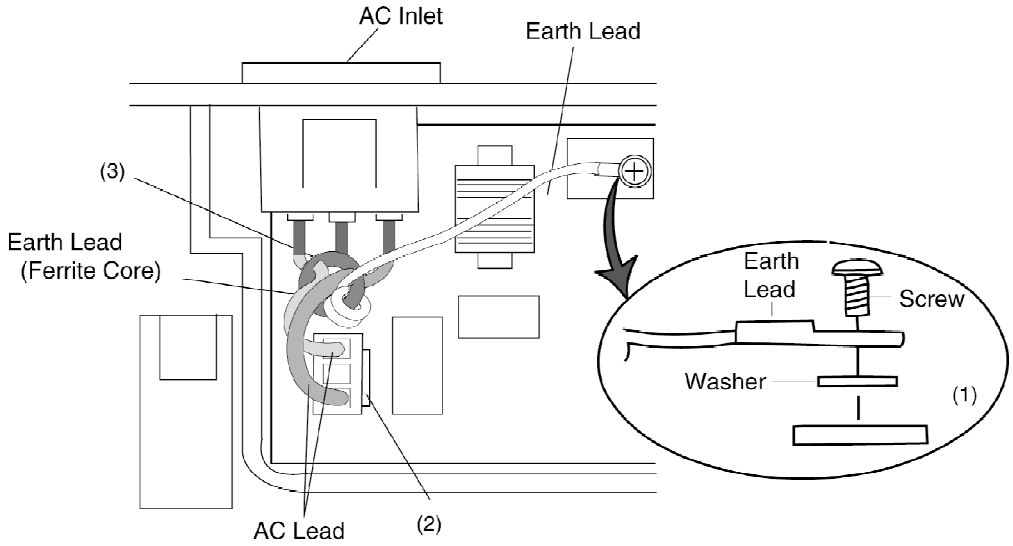
CAUTION

Danger of explosion if battery is incorrectly replaced. Replace only with the same or equivalent type recommended by the manufacture. Dispose of used batteries according to the manufacturer's instructions.

2.5. AC CAUTION

For safety, before closing the lower cabinet, please make sure of the following precautions.

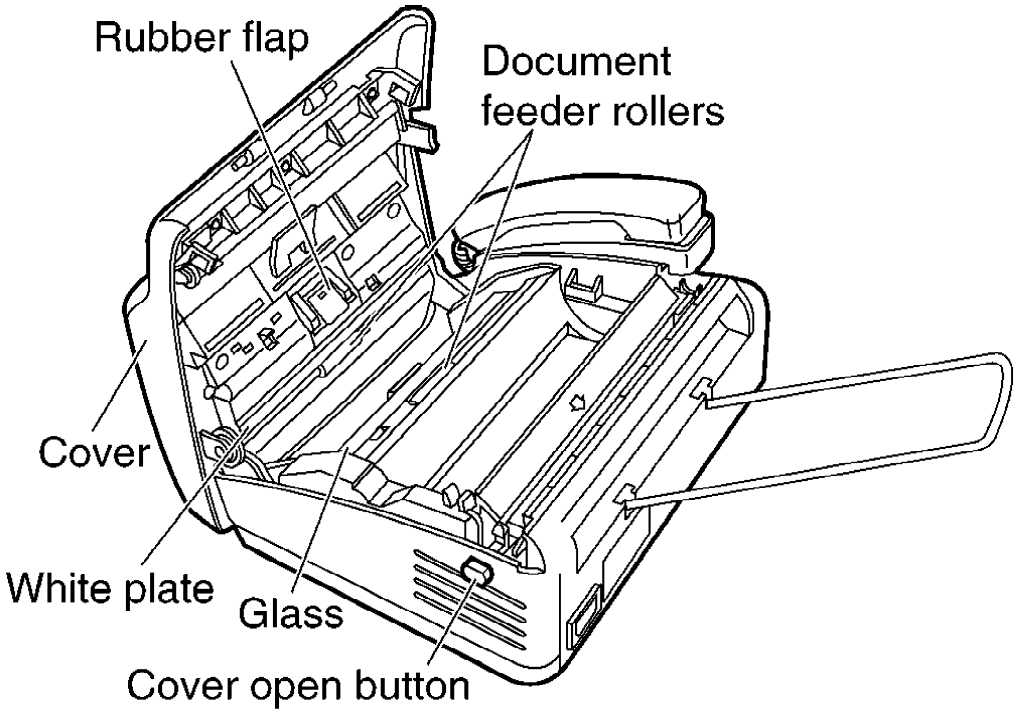
(1) The earth lead is fixed with the screw.
(2) The AC connector is connected properly.
(3) Wrap the AC lead around the core 2 times.



2.6. PERSONAL SAFETY PRECAUTIONS

2.6.1. MOVING SECTIONS OF THE UNIT

Be careful not to let your hair, clothes, fingers, accessories, etc., become caught in any moving sections of the unit. / The moving sections of the unit are the rollers and a gear. There is a separation roller and a document feed roller which are rotated by the document feed motor. A gear rotates the two rollers. Be careful not to touch them with your hands, especially when the unit is operating.



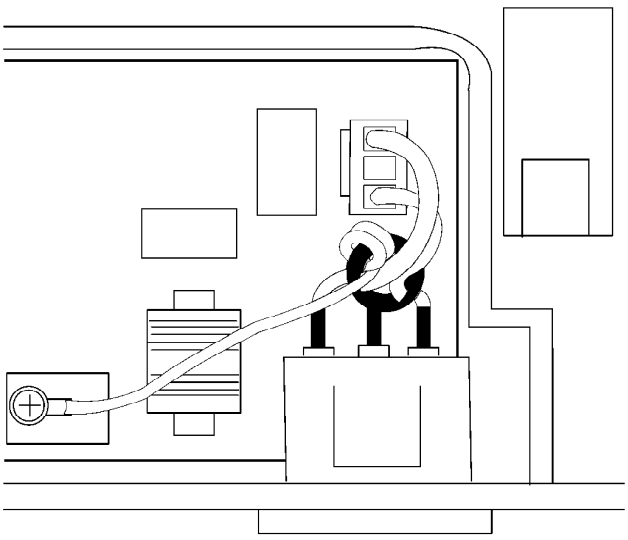
2.6.2. LIVE ELECTRICAL SECTIONS

All the electrical sections of the unit supplied with AC power by the AC power cord are live. / Never disassemble the unit for service with the AC power supply plugged in.

(Bottom view)

AC voltage is supplied to the primary side of the power supply unit.
Therefore, always unplug the AC power cord before disassembling for service.

Be careful of "High Voltage" in this area.



(Bottom view)

2.7. FEATURES

General

- Easy Dial Operation by Jog Dial
- Automatic Paper Cutter with Paper Curl Reduction Technology
- Digital Answering System
- Out of Paper Reception

Facsimile

- Resolution: Standard/Fine/Super Fine/Halftone
- Copier Function
- Help Printout
- Automatic Document Feeder (10 Sheets)
- Easy-to-view LCD (15 Characters)
- Broadcast (up to 10 Stations)

Integrated telephone system

- Telephone Directory (100 Stations)
- Digital Duplex Speakerphone

Digital answering system

- Voice Time/Day Stamp
- Quick & Slow Playback Speeds

2.8. SPECIFICATIONS

Applicable Lines:

Public Switched Telephone Network

Document Size:

Max. 216 mm (8 1/2”) in width
Max. 600 mm (23 5/8”) in length

Effective Scanning Width:

208mm (8 3/16”)

Recording Paper Size:

216 mm max. 30 m (8 1/2”×98”) roll

Effective Printing Width:

208 mm (8 3/16”)

Transmission Time*:

Approx. 15 s/page (Original mode)**

Scanning Density:

Horizontal:
8 pels/mm (203 pels/inch)
Vertical:

3.85 lines/mm (98 lines/inch)—STANDARD mode
7.7 lines/mm (196 lines/inch)—FINE/HALF TONE mode
15.4 lines/mm (392 lines/inch)—SUPER FINE mode

Halftone Level:
64-level

Scanner Type:
Contact Image Sensor (CIS)

Printer Type:
Thermal Printing

Data Compression System:
Modified Huffman (MH), Modified READ (MR)

Modem Speed:
9,600 / 7,200 / 4,800 / 2,400 bps; Automatic Fallback

Operating Environment:
5°C—35°C (41°F—95°F), 45 %—85 % RH (Relative Humidity)

Dimensions (H×W×D):
122 mm × 348 mm × 270 mm (4 13/16” × 13 11/16” × 10 5/8”)

Mass (Weight):
Approx. 2.7 kg (5.9 lb.)

Power Consumption:
Standby: Approx. 4.0 W
Transmission: Approx. 20 W
Reception: Approx. 30 W (When receiving the ITU-T No. 1 Test Chart)
Copy: Approx. 28 W (When copying the ITU-T No. 1 Test Chart)
Maximum: Approx. 110 W (When copying a 100 % black document)

Power Supply:
120 V AC, 60 Hz

Memory Capacity:
Approx. 20 minutes of recording time including the greeting message***

*** Transmission speed depends upon the contents of the pages, resolution, telephone line conditions and capability of the other party's machine.**
**** The 15 second speed is based upon the ITU-T No. 1 Test Chart and original mode. (Refer to ITU-T NO. 1 TEST CHART ().)**

If the capability of the other party's machine is inferior to your unit, the transmission time may be longer.
***** Recording time may be reduced by calling party´s background noise.**

Note:

- **Any details given in these instructions are subject to change without notice.**
- **The pictures and illustrations in these instructions may vary slightly from the actual product.**

2.9. OPTIONAL ACCESSORIES

Parts No.	Description	Comment
KX-A106	Standard thermal recording paper	216 mm × 30 m (8 1/2" × 98') roll, with 25 mm (1") core

2.10. ITU-T NO. 1 TEST CHART

THE SLEREXE COMPANY LIMITED

SAPORS LANE - BOOLE - DORSET - BH 25 8 ER

TELEPHONE BOOLE (945 13) 51617 - TELEX 123456

Our Ref. 350/PJC/EAC

18th January, 1972.

Dr. P.N. Cundall,
Mining Surveys Ltd.,
Holroyd Road,
Reading,
Berks.

Dear Pete,

Permit me to introduce you to the facility of facsimile transmission.

In facsimile a photocell is caused to perform a raster scan over the subject copy. The variations of print density on the document cause the photocell to generate an analogous electrical video signal. This signal is used to modulate a carrier, which is transmitted to a remote destination over a radio or cable communications link.

At the remote terminal, demodulation reconstructs the video signal, which is used to modulate the density of print produced by a printing device. This device is scanning in a raster scan synchronised with that at the transmitting terminal. As a result, a facsimile copy of the subject document is produced.

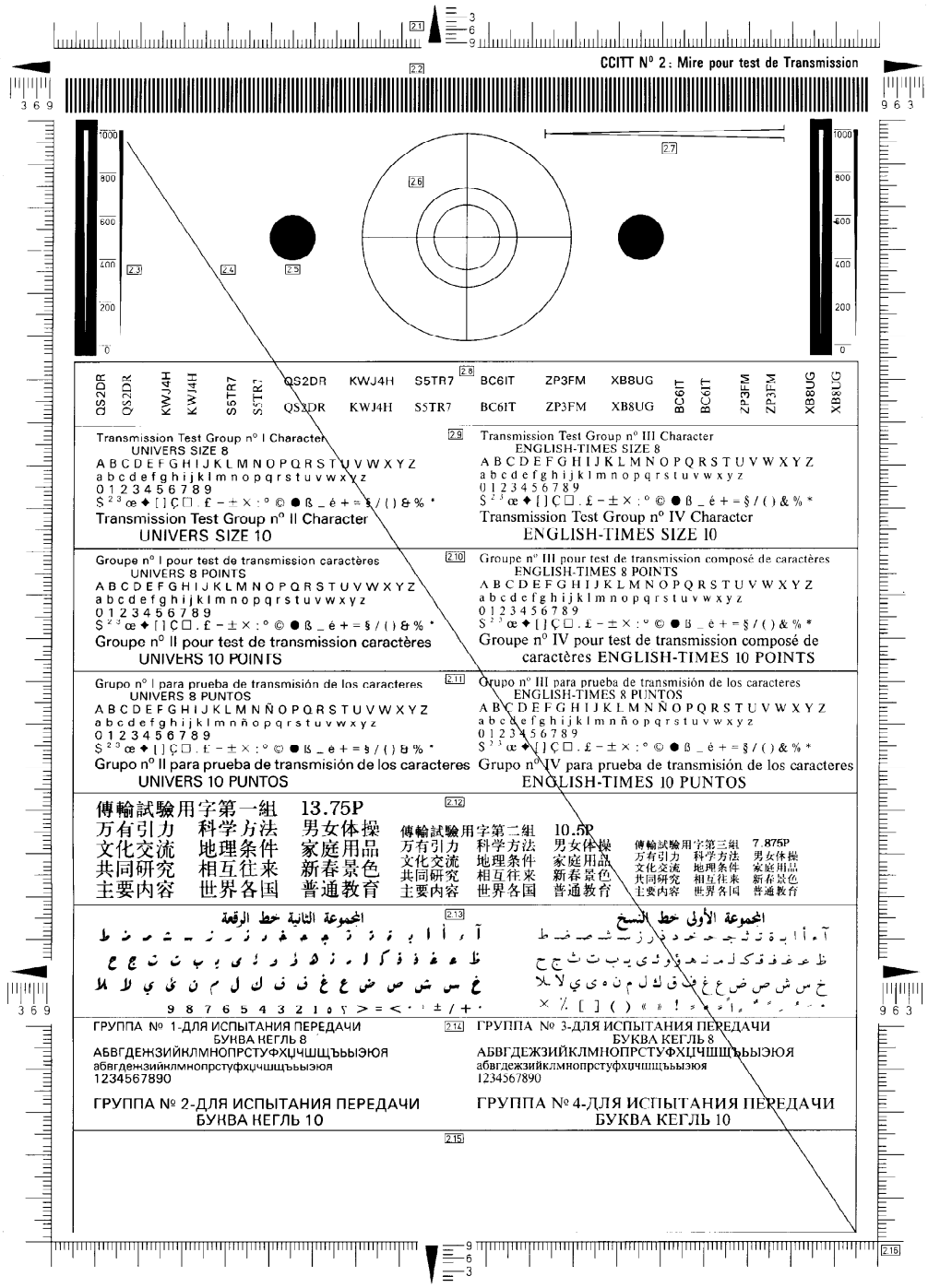
Probably you have uses for this facility in your organisation.

Yours sincerely,

Phil.

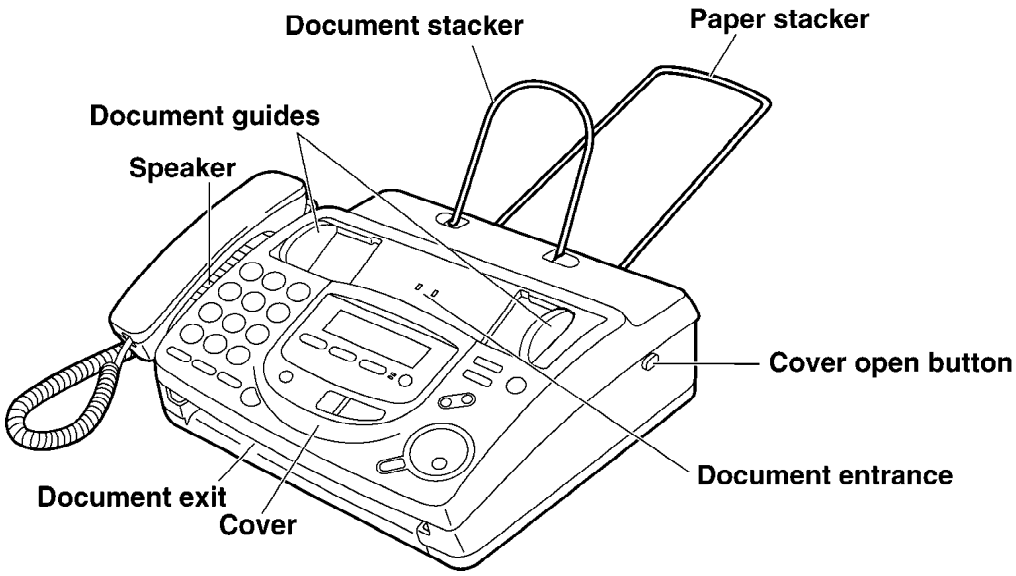
P.J. CROSS
Group Leader - Facsimile Research

2.10.1. CCIT NO. 2 TEST CHART

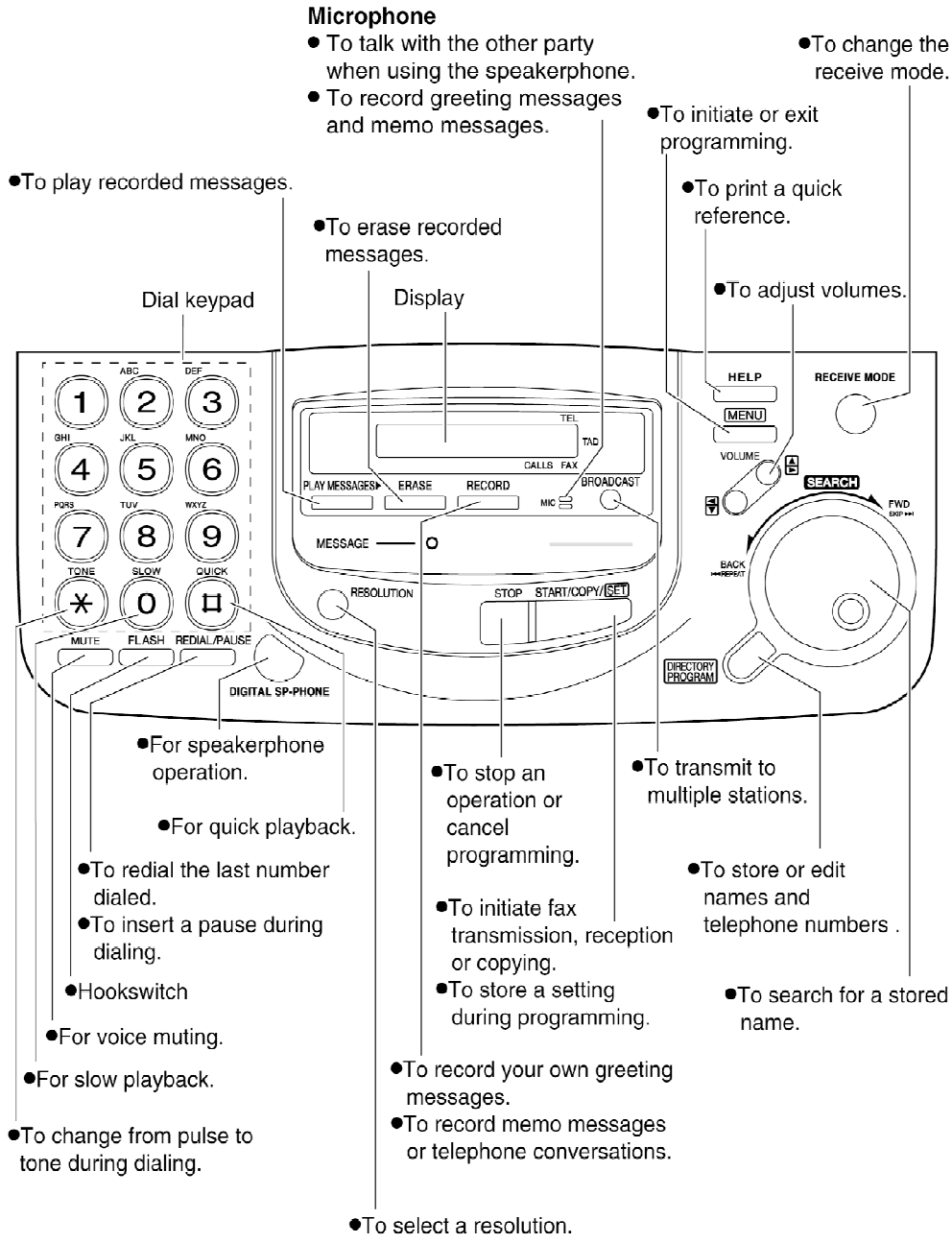


2.11. LOCATION OF CONTROLS

2.11.1. OVERVIEW

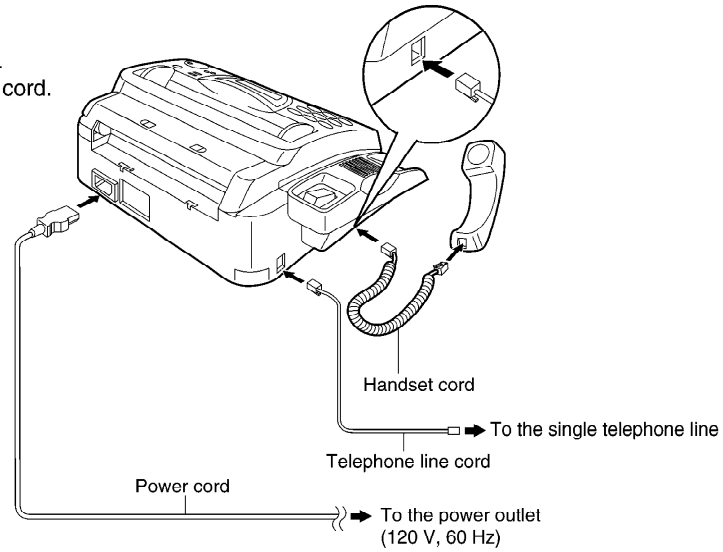


2.11.2. CONTROL PANEL



2.12. CONNECTIONS

1.Connect the handsset cord.
2.Connect the telephone line cord.
3.Connect the power cord.

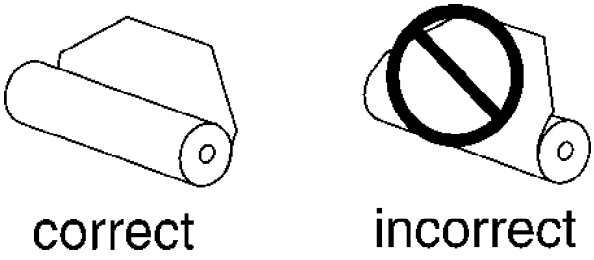


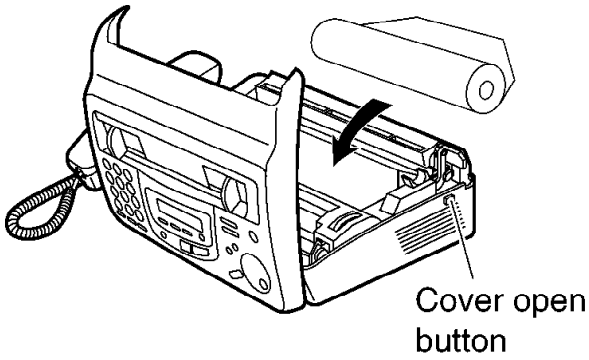
NOTE
When you operate this products, the power outlet should be near the product and easily accessible.

2.13. INSTALLATION

2.13.1. INSTALLING THE RECORDING PAPER

1 Open the cover by pressing the cover open button and install the recording paper roll.

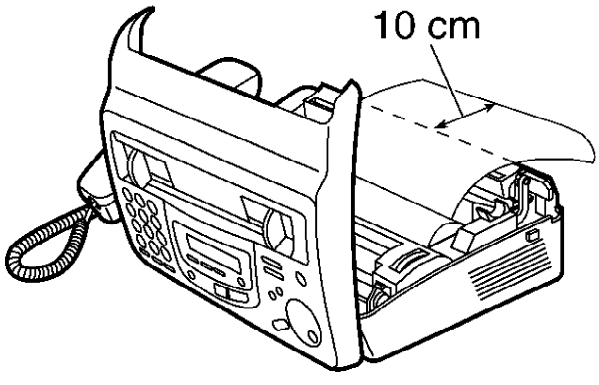




If the paper is secured with glue or tape, cut approximately 15 cm (6 inches) from the beginning.

2 Insert the leading edge of the paper into the opening above the thermal head and pull it out of the unit.

-Make sure that there is no slack in the paper roll.

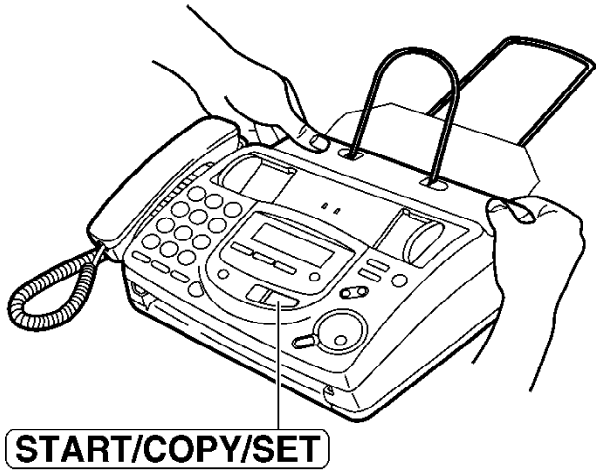


3 Close the cover securely by pushing down on both ends.

Display: PRESS START

4 Press START/COPY/SET

-The whit will eject the paper slightly and cut it.

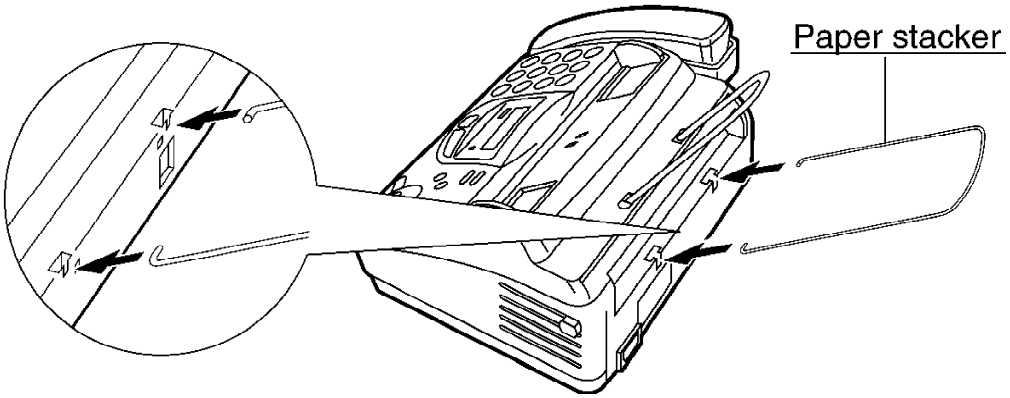


Note:

- **Only use the included roll of paper or specified recording paper, or else the print quality may be affected and/or excessive thermal head wear may occur.**
- **To oreder recording paper, see OPTIONAL ACCESSORIES ().**
- **When the power cord is connected, every time you close the cover a message will be printed if the recording paper is set to the wrong side, a message will not be printed.**
  Install the paper correctly.
- **If you do not press START/COPY/SET within 30 seconds after closing the cover, the whit will automatically eject the paper slightly and cut it.**

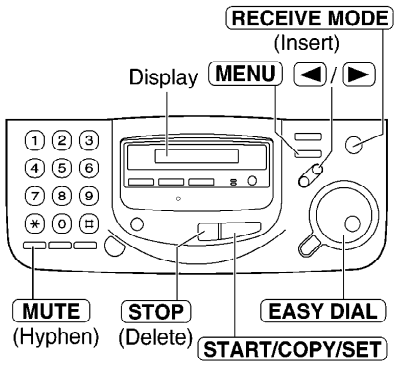
2.13.2. PAPER STACKER

Install the paper stacker.



2.13.3. SETTING YOUR LOGO

The logo can be your company, division or name.



1 Press **MENU**.

Display: `SYSTEM SET UP`
(PROG. SISTEMA)

2 Press **#**, then **0** **2**.

`YOUR LOGO`
(SU LOGO)

3 Press **START/COPY/SET**.

`LOGO=`

4 Enter your logo, up to 30 characters, by using the dial keypad. See the next page for details.

Example: Bill

1. Press **2** twice.

`LOGO=B`

2. Press **4** six times.

Cursor

`LOGO=Bi`

3. Press **5** six times.

`LOGO=Bil`

4. Press ► to move the cursor to the next space and press **5** six times.

`LOGO=Bill`

To enter the same number key continuously, move the cursor to the next space.

5 Press **START/COPY/SET**.

`SETUP ITEM [ ]`
(NO. PROG. [ ])

6 Press **MENU**.

To correct a mistake

Press ◄ or ► to move the cursor to the incorrect character, then make the correction.

To delete a character

Move the cursor to the character you want to delete and press **STOP**.

To insert a character

1. Press ◄ or ► to move the cursor to the position to the right of where you want to insert the character.
2. Press **RECEIVE MODE** (Insert) to insert a space and enter the character.

Note: Words in brackets ( ) are Spanish. A translated version for each market is available with this model series.

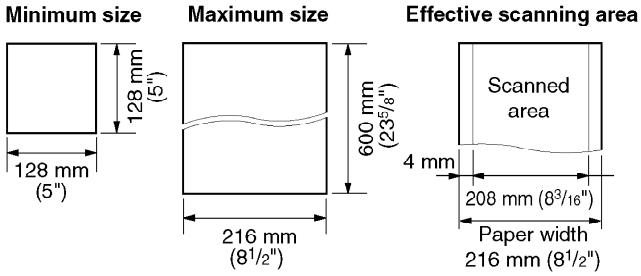
2.13.4. TO SELECT CHARACTERS WITH THE DIAL KEYPAD

Pressing the dial keys will select a character as shown below.

Keys	Characters
1	1 [ ] { } + − / = , . _ ' : ; ? |
2	A B C a b c 2
3	D E F d e f 3
4	G H I g h i 4
5	J K L j k l 5
6	M N O m n o 6
7	P Q R S p q r s 7
8	T U V t u v 8
9	W X Y Z w x y z 9
0	Ñ ñ á é í ó ú 0 ( ) < > ! " # $ % & ¥ ⁎ @ ^ ' →
MUTE	Tecla **guión** (Se utiliza para insertar un guión.)
RECEIVE MODE	Tecla **insertar** (Se utiliza para insertar un caracter o un espacio.)
STOP	Tecla **borrar** (Se utiliza para borrar un caracter.)
◀ ○	Tecla ◀ (Se utiliza para mover el cursor hacia la izquierda.)
○ ▶	Tecla ▶ (Se utiliza para mover el cursor hacia la derecha.) Para introducir otro caracter utilizando la misma tecla de número, mueva el cursor al siguiente espacio.

0	Ã Õ Ç ã Õ ç Á É Í Ó Ú á ó í ó ú 0 ( ) < > ! " # $ % & ¥ ⁎ @ ^ ' →

2.13.5. DOCUMENTS YOU CAN SEND



Document weight

Single sheet:
45 g/m² to 90 g/m²
(12 lb. to 24 lb.)

Multiple sheets (up to 10 sheets):
60 g/m² to 75 g/m²
(16 lb. to 20 lb.)

Note:

Remove clips, staples or other similar fastening objects. / Check that ink, paste or correction fluid has dried. / Do not send the following types of documents. Use copies for fax transmission.

- **Chemically treated paper such as carbon or carbonless duplicating paper**
- **Electrostatically charged paper**
- **Heavily curled, creased or torn paper**
- **Paper with a coated surface**
- **Paper with a faint image**
- **Paper with printing on the opposite side that can be seen through the front (e.g. newspaper)**

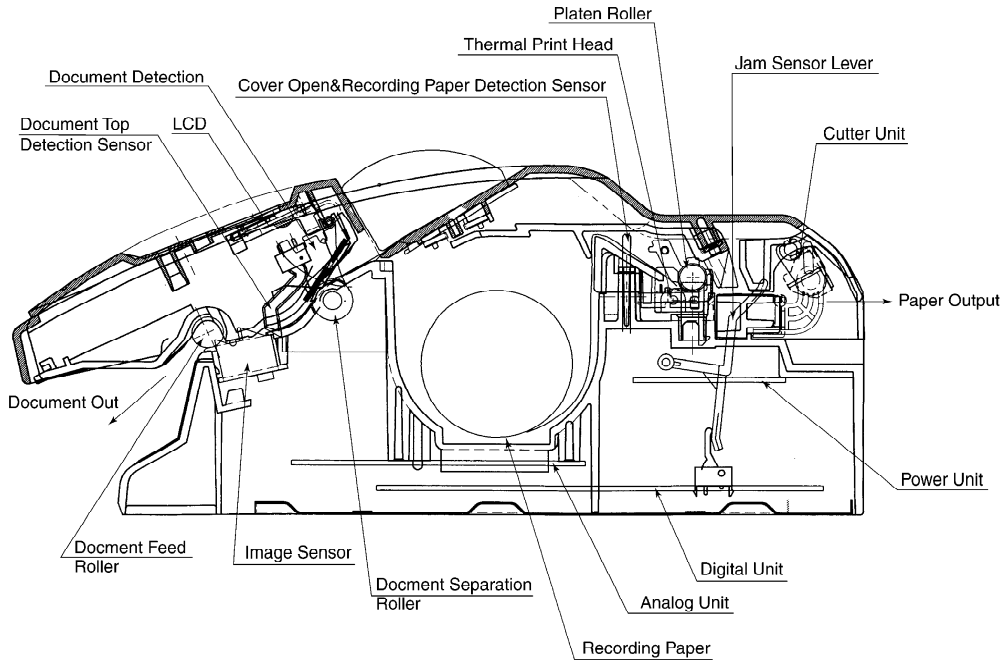
2.14. MAINTENANCE ITEMS AND COMPONENT LOCATIONS

2.14.1. OUTLINE

MAINTENANCE AND REPAIRS ARE PERFORMED USING THE FOLLOWING STEPS.

1. **Periodic maintenance**
   Inspect the equipment periodically and if necessary, clean any contaminated parts.
2. **Check for breakdowns**
   Look for problems and consider how they arose. / If the equipment can be still used, perform copying, self testing or communication testing.
3. **Check equipment**
   Perform copying, self testing and communication testing to determine if the problem originates from the transmitter, receiver or the telephone line.
4. **Determine causes**
   Determine the causes of equipment problem by troubleshooting.
5. **Equipment repairs**
   Repair or replace the defective parts and take appropriate measures at this stage to ensure that the problem will not recur.
6. **Confirm normal operation of the equipment**
   After completing the repairs, conduct copying, self testing and communication testing to confirm that the equipment operates normally.
7. **Record keeping**
   Make a record of the measures taken to rectify the problem for future reference.

2.14.2. MAINTENANCE CHECK ITEMS/COMPONENT LOCATIONS



2.14.2.1. MAINTENANCE LIST

NO.	OPERATION	CHECK	REMARI
1	Document Path	Remove any foreign matter such as paper.	—
2	Rollers	If the roller is dirty, clean it with a damp cloth then dry thoroughly.	See MAINTENAN
3	Thermal Head	If the thermal head is dirty, clean the printing surface with a cloth moistened with denatured alcohol (alcohol without water), then dry thoroughly.	See MAINTENAN and DISASSEME INSTRUCTIONS
4	Glass	If the glass is dirty, clean the with a dry soft cloth.	See MAINTENAN
5	Sensors	Document sensor (PS1), Read position sensor (PS2), Recording paper/cover open sensor (SW1).	See SENSOR SE
6	Abnormal, wear and tear or loose parts	If the glass is dirty, clean them with a dry soft cloth.	—

2.14.2.2. MAINTENANCE CYCLE

No.	Item	Cleaning Cycle	Replacement	
			Cycle	Procedure
1	Separation Roller (Ref. No. 10)	3 months	7 years* (100,000 documents)	See HOW TO REMOVE THE RC
2	Separation Roller (Ref. No. 12)	3 months	7 years* (100,000 documents)	See HOW TO REMOVE THE RC
3	Feed Rollers (Ref. No. 7)	3 months	7 years* (100,000 documents)	See HOW TO REMOVE THE RC
4	Thermal Head (Ref. No. 79)	3 months	7 years* (100,000 documents)	See HOW TO REMOVE THE TH HEAD AND CUTTER BLOCK ().

↑

These values are standard and may vary depending on usage conditions.

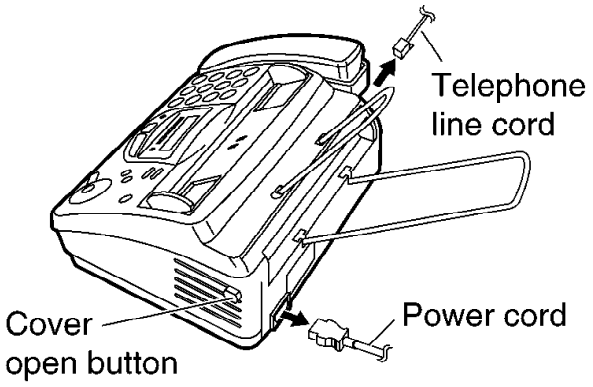
2.14.3. MAINTENANCE

2.14.3.1. CLEANING THE DOCUMENT FEEDER UNIT

If misfeeding occurs frequently or if dirty patterns or black bands appear on a copied or transmitted document, clean the document feeder.

1 Disconnect the power cord and the telephone line cord.

2 Open the cover by pressing the cover open button.

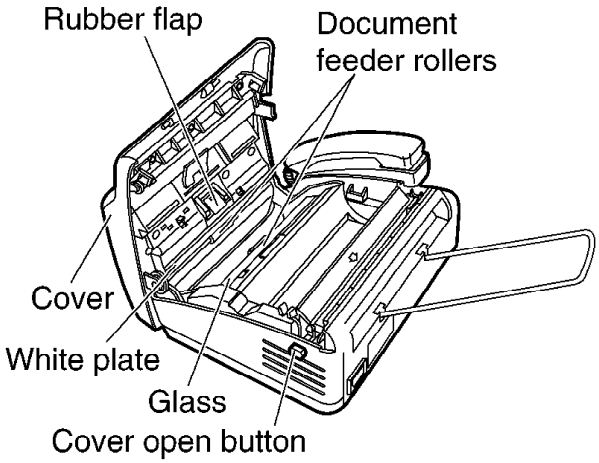


3 Clean the document feeder rollers, sub roller and rubber flap with a cloth moistened with isopropyl rubbing alcohol, and let all parts dry thoroughly.

4 Clean the white plate and glass with a soft dry cloth.

5 Close the cover securely by pushing down on both ends.

6 Connect the power cord and the telephone line cord.



caution:
Do not use paper products, such as paper towels or tissues, to clean the inside of the unit.

2.14.3.2. CLEANING THE THERMAL HEAD

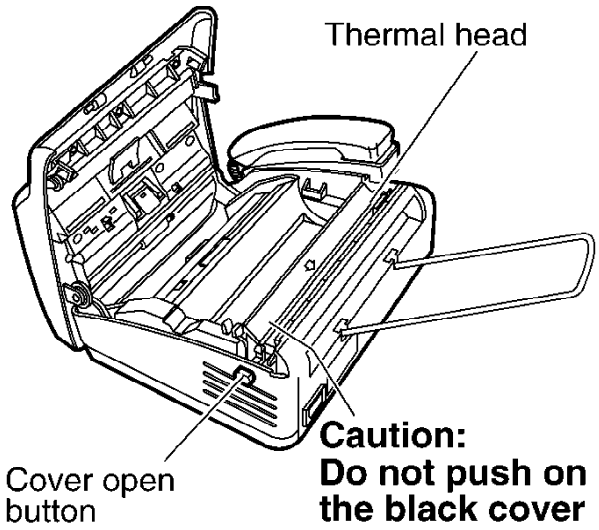
If dirty patterns or black bands appear on a copied or received document, clean the thermal head.

1 Disconnect the power cord and the telephone line cord.

2 Disconnect the power cord and the telephone line cord.

3 Clean the thermal head with a cloth moistened with isopropyl rubbing alcohol, and let it dry thoroughly.

4 Close the cover securely by pushing down on both ends.



5 Connect the power cord and the telephone line cord.

Caution:
To prevent a malfunction due to static electricity, do not use a dry cloth and do not touch the thermal head directly with your fingers.

3. TROUBLESHOOTING GUIDE

3.1. TROUBLESHOOTING SUMMARY

3.1.1. TROUBLESHOOTING

After confirming the problem by asking the user, troubleshoot according to the instructions and observe the following precautions.

3.1.2. PRECAUTIONS

1. **If there is a problem with the print quality or the paper feed, first check if the installation space and the print paper meets the specifications, the paper selection lever/paper thickness lever is set correctly, and the paper is set correctly without any slack.**
2. **Before troubleshooting, first check that the connectors and cables are connected correctly (not loose).**
   If the problem occurs randomly, check it very carefully.
3. **When connecting the AC power cord with the unit case and checking the operation, exercise utmost care when handling electric parts in order to avoid electric shocks and short-circuits.**
4. **After troubleshooting, double check that you have not forgotten any connectors, left any loose screws, etc.**
5. **Always test to verify that the unit is working normally.**

3.1.3. WHEN YOU DON'T KNOW HOW TO OPERATE THE UNIT, USE THE HELP FUNCTION

- How to use: 1. Press **HELP**.
  2. Press **EASY DIAL** until the desired item is displayed.
  3. Press **START/COPY/SET**.

3.2. USER RECOVERABLE ERRORS

If the unit detects a problem, the following messages will appear on the display.

Display Message	Cause & Remedy
CALL SERVICE 1	There is something wrong with the unit. Contact our service personnel. [This error is displayed when the thermal head dose not warm up. Check the thermistor on the thermal head and connector lead. (for technicians)]
CALL SERVICE 2	This message appears when the gear is not in an idle state. Check the GEAR BLOCK.
CHECK COVER	The cover is open. Close it.
OUT OF PAPER	The unit ran out of recording paper. Install a recording paper roll.
CHECK DOCUMENT	The document is not fed into the unit properly. Reinsert the document. If misfeeding occurs frequently, clean the document feeder rollers and try again. If the problem remains, adjust the feeder pressure. Attempted to transmit a document longer than 600 mm. Press the **STOP** button to remove the document. Divide the document into two or more sheets and try again.
CHECK MEMORY	Memory (telephone numbers, parameters, etc.) has been erased. Re-program. [The backup battery on the top of the digital board may be low or dead, so check it.]
MEMORY FULL	There is no room left in memory to record a message. Erase some or all of the messages.
NO RESPONSE	The other party's fax machine is busy or ran out of recording paper. Try again.
NO TAD GREETING	Your TAD/FAX greeting is not recorded. Record a greeting message.
NO TRNS-GREET.	Your message transfer greeting is not recorded. Record a greeting message.
DIRECTORY FULL	There is no space to store new stations in the EASY DIAL directory. Erase unnecessary stations.
FAX IN MEMORY	There unit has a document in memory. See the other displayed message instructions to print out the document.
PAPER JAMMED	The recording paper is jammed, Clear the jammed paper. (Refer to **2.2.2. PAPER JAM**)
POLLING ERROR	The other party's fax machine does not have a polling feature. Check with the other party.
REDIAL TIME OUT	The other party's fax machine is busy or ran out of recording paper. Try again. (Refer to **2.2.1. DOCUMENT JAM**)
REMOVE DOCUMENT	The document is jammed. Remove the jammed document. [Alternately, turn off service code #559 to enable sending of documents longer than 600 mm.]
TRANSMIT ERROR	A transmission error occurred. Try again.
UNIT OVERHEATED	The unit is too hot. Let the unit cool down. [If many copies are nearly all black, this message will be displayed. When this occurs, open the front cover and let the unit cool down.]

Notes: The explanations given in the [ ] are for servicemen only.
Words in brackets ( ) are Spanish. A translated version for each market is available with this model series.

CROSS REFERENCE:

TRANSLATION LIST (ENGLISH,PORTUGUESE) ()

DOCUMENT JAM ()

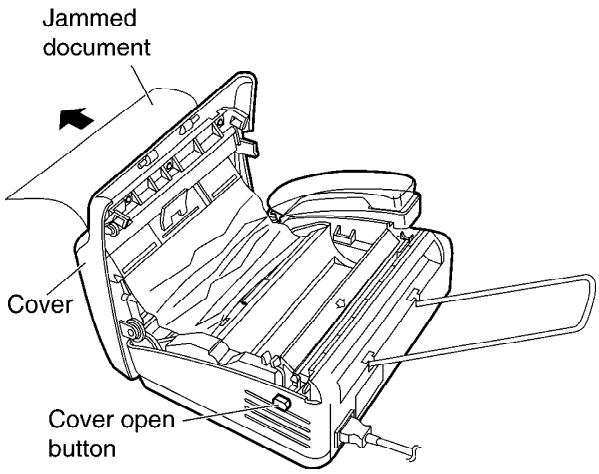
PAPER JAM ()

3.2.1. DOCUMENT JAM

If the unit does not release the document during feeding, remove the jammed document as follows.

1 Open the cover by pressing the cover open button.

2 Remove the jammed document carefully.

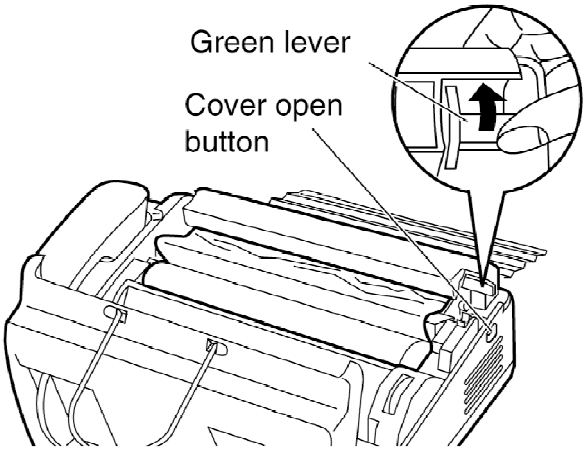


3 Close the cover securely by pushing down on both ends.

NOTE:
Do not pull out the jammed paper forcibly before opening the cover.

3.2.2. PAPER JAM

1 Open the cover by pressing the cover open button . / Then lift the green lever to release the paper cutter and / remove the recording paper roll.



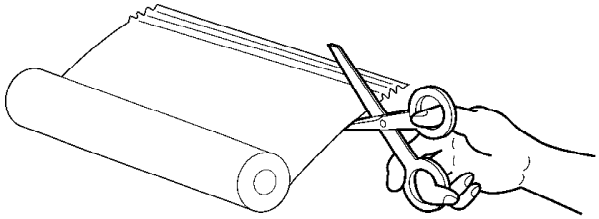
Note:
When the green lever is not released, press "4" key and "STOP" key at the same time. / Then the green lever position is reset.

Caution:

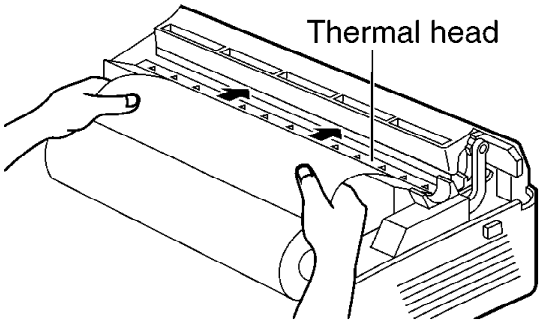
-Keep your fingers away from the paper cutter.

-It dose not operate while the calling, the sending faxes and / the printing.

2 Cut off the wrinkled portion, and replase the recording paper / roll in the proper direction.



3 Insert the leading edge of the paper into the opening above / the thermal head and pull it out of the unit.

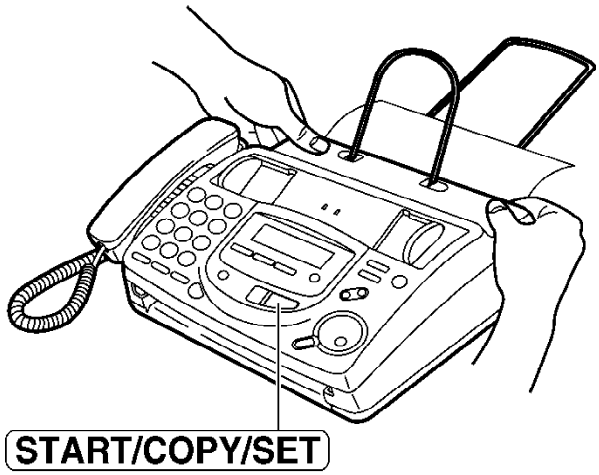


-Make sure that there is no slack in the paper roll.

-If the paper cannot be inserted, try lifting the green lever again.

4 Close the cover securely by pushing down on both ends.

Display: PRESS START



5 Press START/COPY/SET

-The unit whit will eject the paper slightly and cut it.

Note:

- When the power cord is connected. everytime you close the cover a message will be printed. If the recording paper is set to the wrongside, a message will not be printed. Install the paper correctly.

- If you do not press START/COPY/SET within 30 seconds after closing the cover, the unit will automatically eject the paper slightly and cut it. /

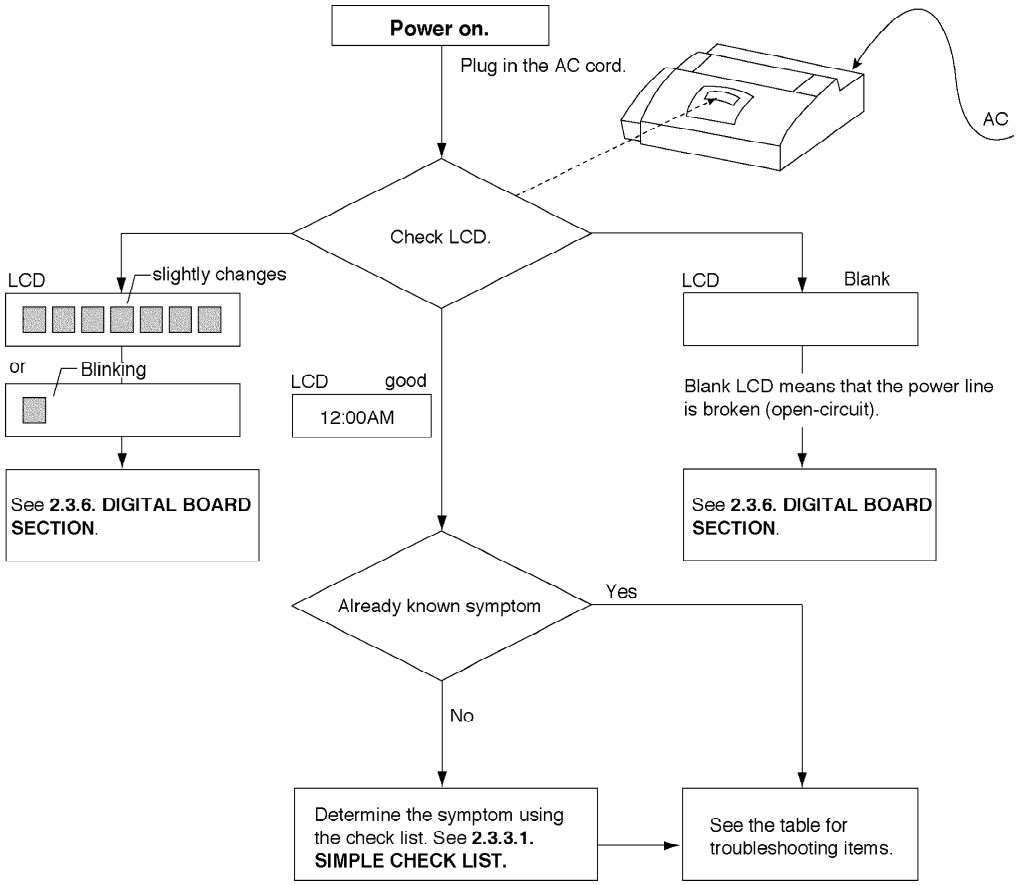
3.3. TROUBLESHOOTING DETAILS

3.3.1. OUTLINE

Troubleshooting guide provides a logical path of deduction to assist in locating a fault and suggests methods of restoring the unit to full working condition. Use the reported symptoms of the fault to determine the best troubleshooting method. Even difficult faults can be tracked to a specific block or area, for example, the "Digital Board" or "Image Sensor". / A variety of fault descriptions from customers often point to the same area and, for this reason, careful analysis of the reported symptoms is required. After every repair, test all functions to ensure no problems are evident.

3.3.2. STARTING TROUBLESHOOTING

Select the appropriate troubleshooting method according to the symptoms.



CROSS REFERENCE:
SIMPLE CHECK LIST ()
DIGITAL BOARD SECTION ()

3.3.3. TROUBLESHOOTING ITEMS TABLE

FUNCTION	SYMPTOM	SEE THIS PAGE.
Printing	Expanded print Image is distorted. Black or White vertical lines appear.	See **2.3.4. ADF (AUTO DOCUMENT FEED) SECTION**.
ADF (Auto Document Feeder)	No feed Document jam Multiple feed Skew	See **2.3.4. ADF (AUTO DOCUMENT FEED) SECTION**.
	Paper JAM	See **2.2.2. PAPER JAM**
Abnormal mechanical sound	Abnormal sound from the product	See **2.3.4. ADF (AUTO DOCUMENT FEED) SECTION**
Power supply	Voltage output is abnormal.	See **2.3.9. POWER SUPPLY BOARD SECTION**
Operation panel	Keys are not accepted.	See **2.3.10. OPERATION BOARD SECTION**.
Sensor	If the electric circuit is the cause, "REMOVE DOCUMENT" will be displayed.	See **2.3.11. SENSOR BOARD SECTION**.
Communication FAX, TEL (Analog/Digital board)	Cannot communicate by fax. Error code is displayed. Cannot talk. DTMF tone doesn't work. Handset/Monitor sound, volume	See **2.3.5.1. DEFECTIVE FACSIMILE SECTION**. } The analog board may cause these symptoms. } See **2.3.7. ANALOG BOARD SECTION**.

CROSS REFERENCE:

PAPER JAM ()
ADF (AUTO DOCUMENT FEED) SECTION ()
DEFECTIVE FACSIMILE SECTION ()
ANALOG BOARD SECTION ()
POWER SUPPLY BOARD SECTION ()
OPERATION BOARD SECTION ()
SENSOR SECTION ()

3.3.3.1. SIMPLE CHECK LIST

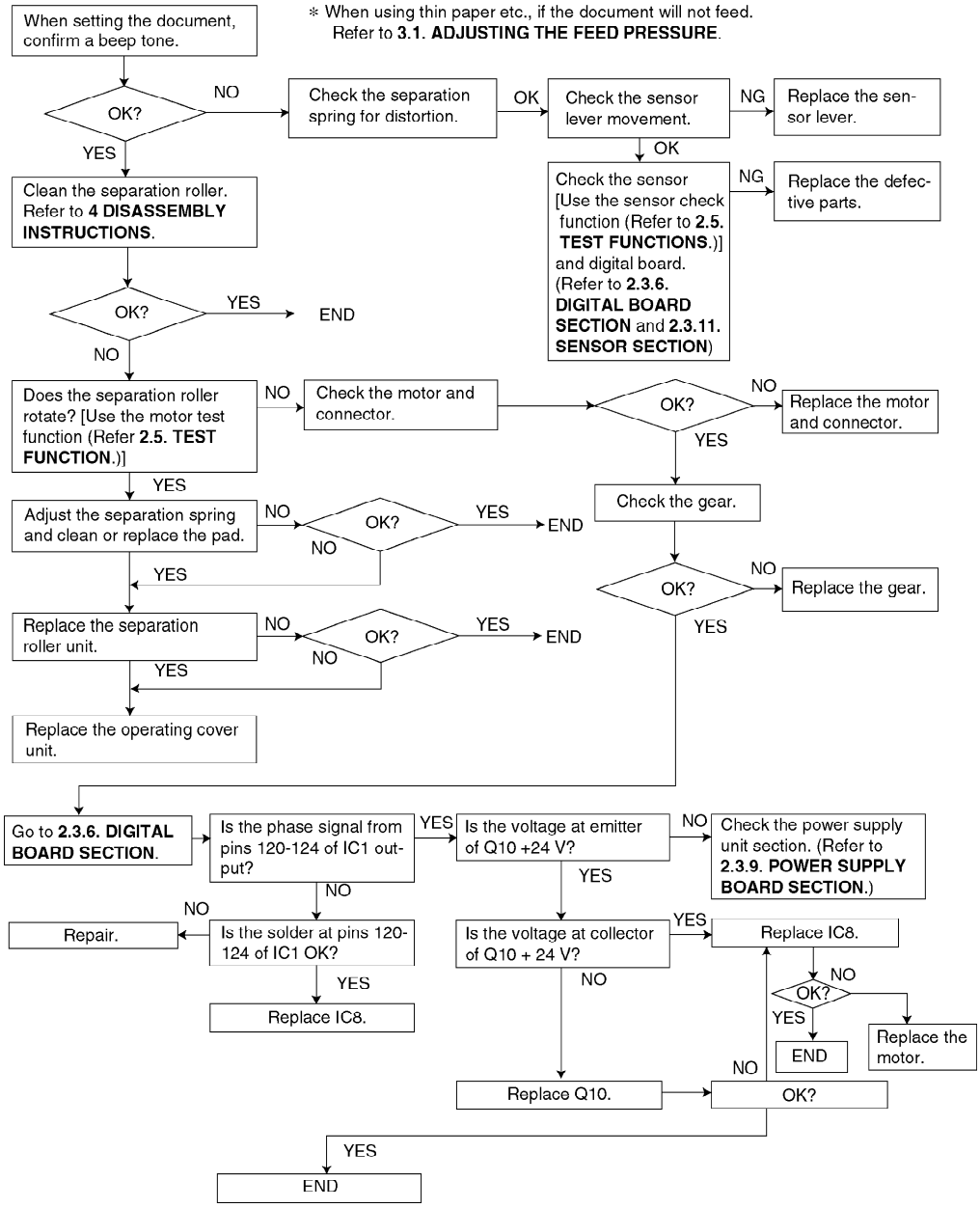
FUNCTION		JUDGEMENT	REFERENCE
FAX operation	Transmission	OK / NG	
	Receiving	OK / NG	
Copy operation	FINE mode	OK / NG	
	HALF TONE mode	OK / NG	
Telephone operation	Handset transceiver / receive	OK / NG	
	SP-PHONE sound	OK / NG	
	Ringer sound	OK / NG	
	Dial operation	OK / NG	
	Volume operation	OK / NG	
Operation panel	Key check	OK / NG	SERVICE CODE 561*
	LCD check	OK / NG	SERVICE CODE 558*
Sensor	Sensor check	OK / NG	SERVICE CODE 815*
Clock		OK / NG	Is the time kept correctly? Check with another clock.
Digital Speaker phone		OK / NG	
Digital TAM	Greeting Rec/Play	OK / NG	
	Incoming message Rec/Play	OK / NG	
	Memo Rec/Play	OK / NG	

* Check according to the service code referring to **2.5. TEST FUNCTION**.

CROSS REFERENCE:
TEST FUNCTIONS ()

3.3.4. ADF (AUTO DOCUMENT FEED) SECTION

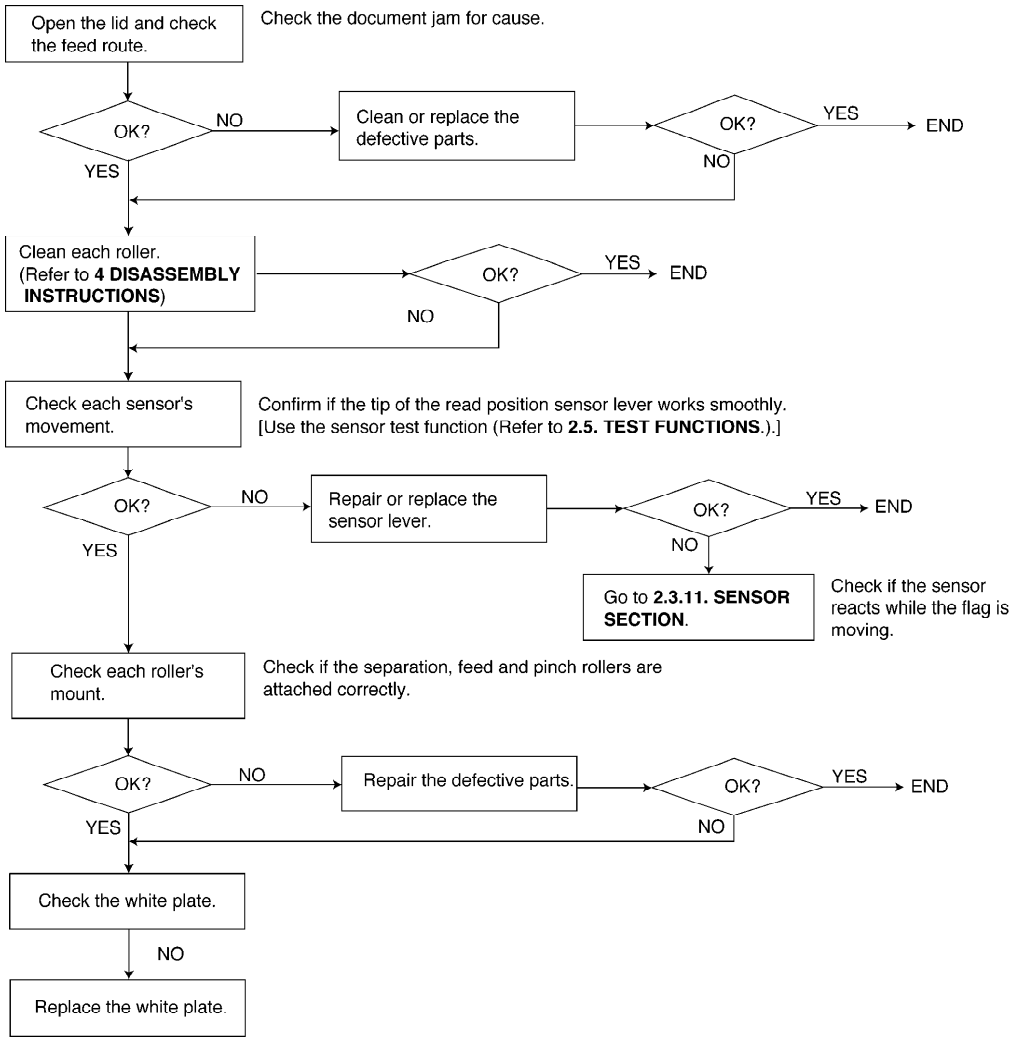
3.3.4.1. NO DOCUMENT FEED



CROSS REFERENCE:

DIGITAL BOARD SECTION ()
POWER SUPPLY BOARD SECTION ()
SENSOR SECTION ()
TEST FUNCTIONS ()
ADJUSTING THE FEED PRESSURE ()
DISASSEMBLY INSTRUCTIONS ()

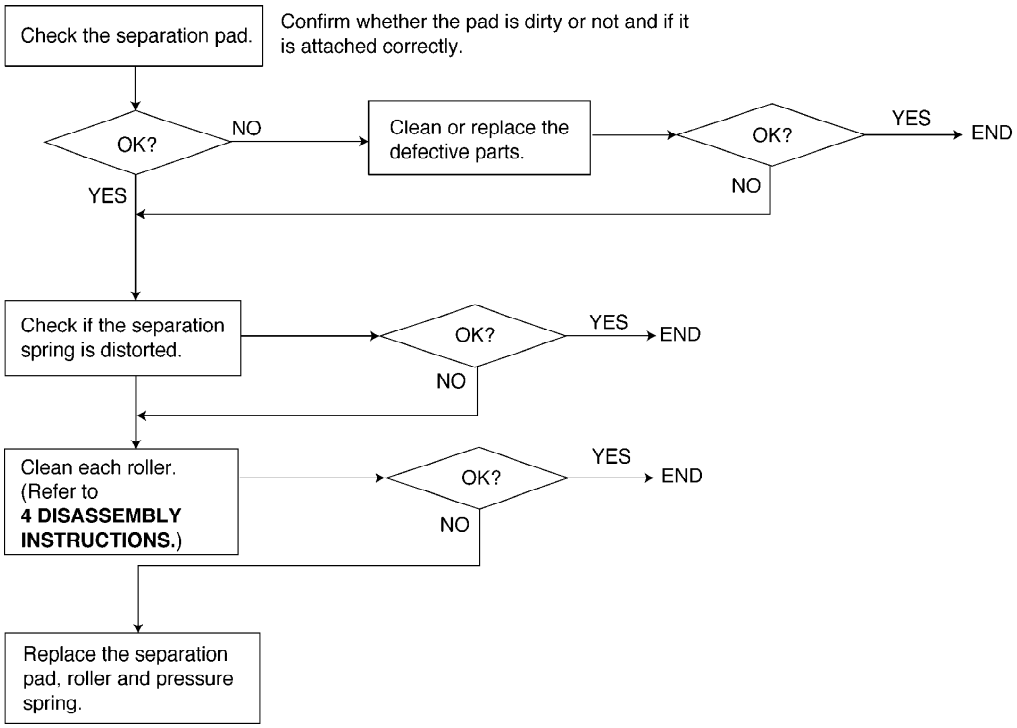
3.3.4.2. DOCUMENT JAM



CROSS REFERENCE:
SENSOR SECTION ()
DISASSEMBLY INSTRUCTIONS ()

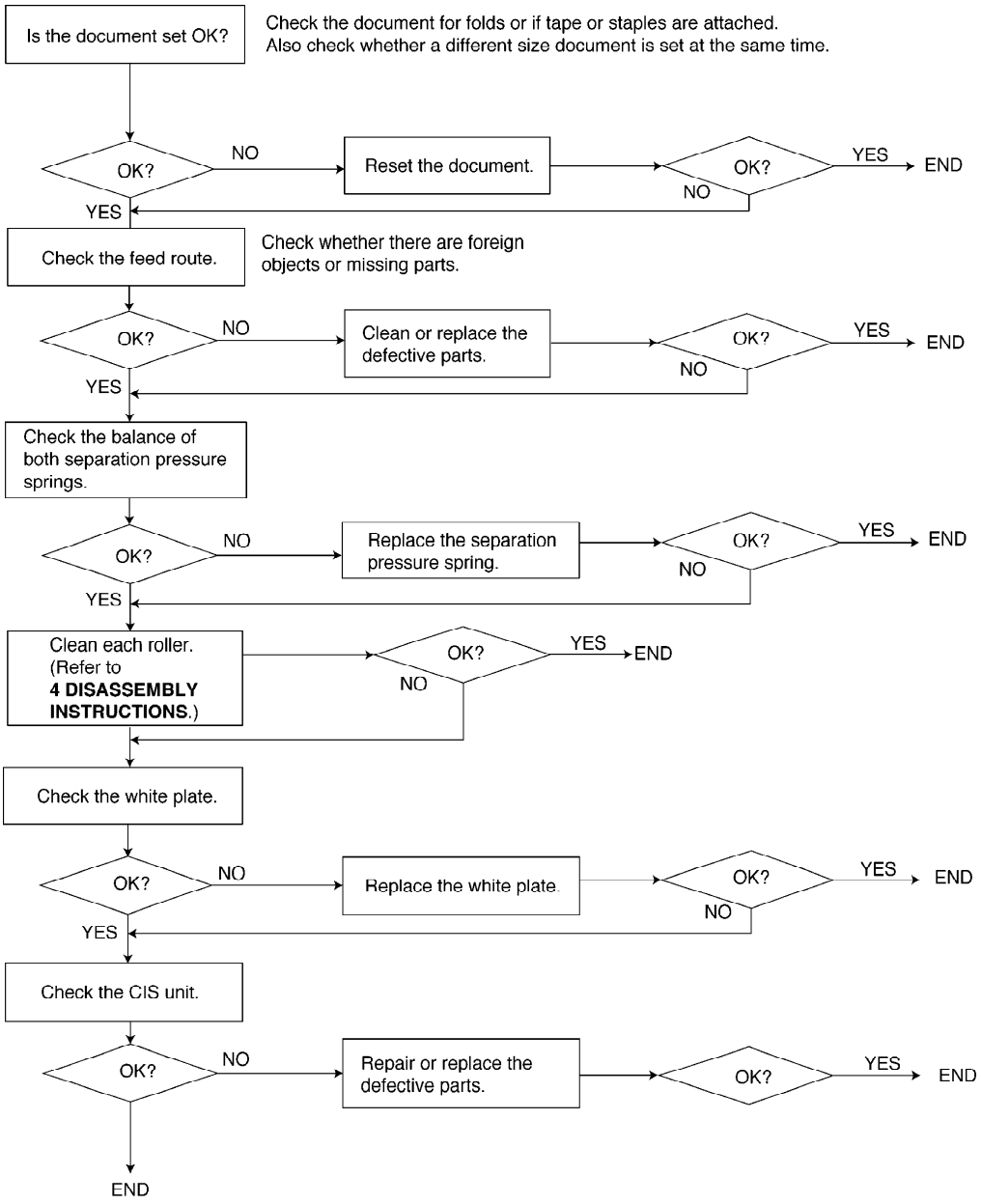
3.3.4.3. MULTIPLE FEED

When using thick paper etc., If the document will not feed. Refer to ADJUSTING THE FEED PRESSURE ().



CROSS REFERENCE:
DISASSEMBLY INSTRUCTIONS ()

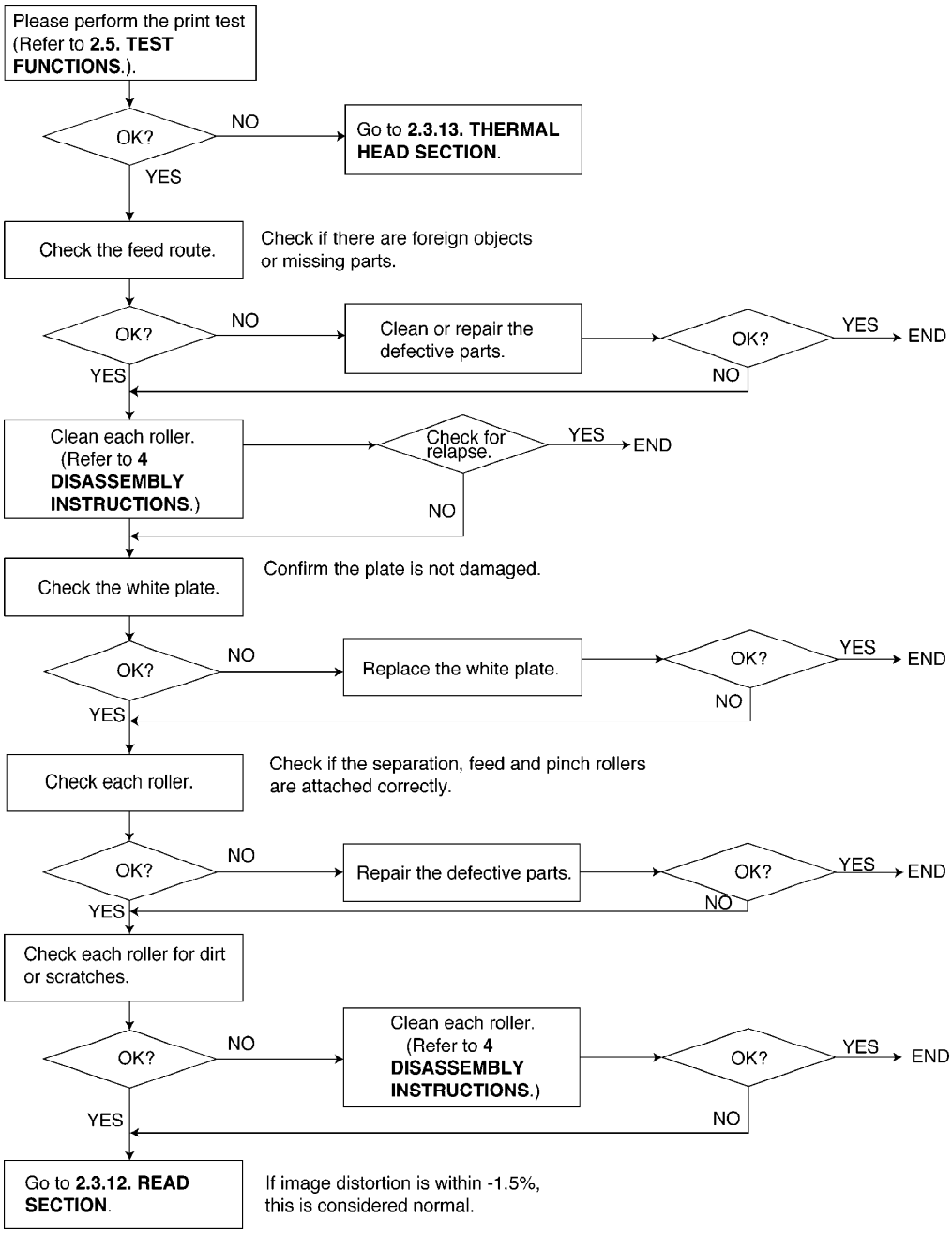
3.3.4.4. SKEW



CROSS REFERENCE:

DISASSEMBLY INSTRUCTIONS ()

3.3.4.5. IMAGE IS DISTORTED (WHEN PRINTING)



CROSS REFERENCE:

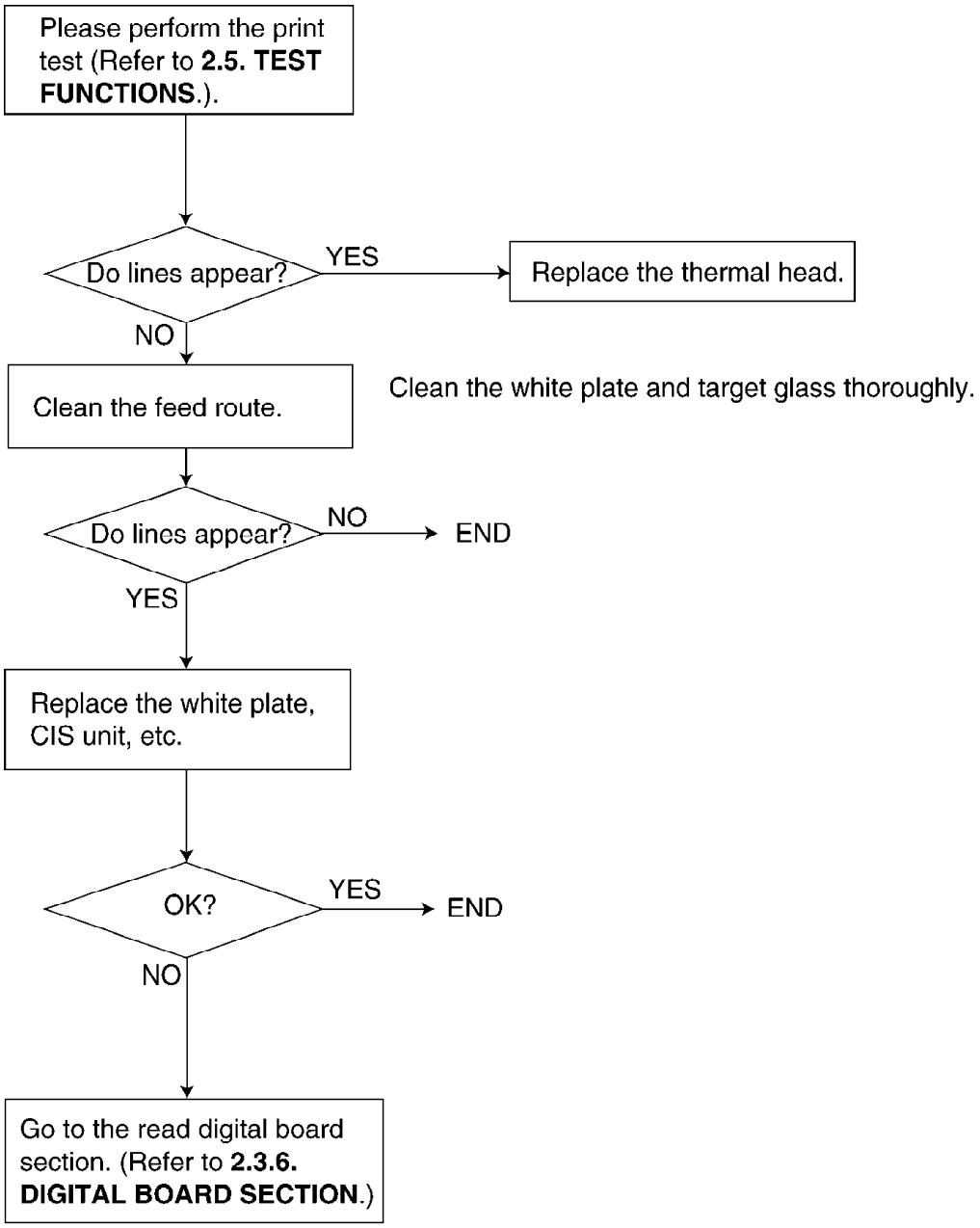
READ SECTION ()

THERMAL HEAD SECTION ()

TEST FUNCTIONS ()

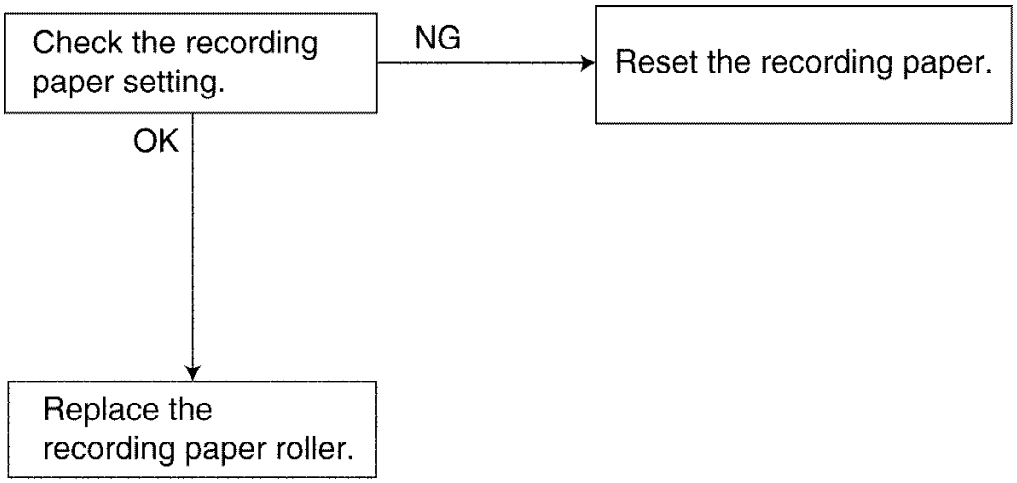
DISASSEMBLY INSTRUCTIONS ()

3.3.4.6. BLACK OR WHITE VERTICAL LINES APPEAR

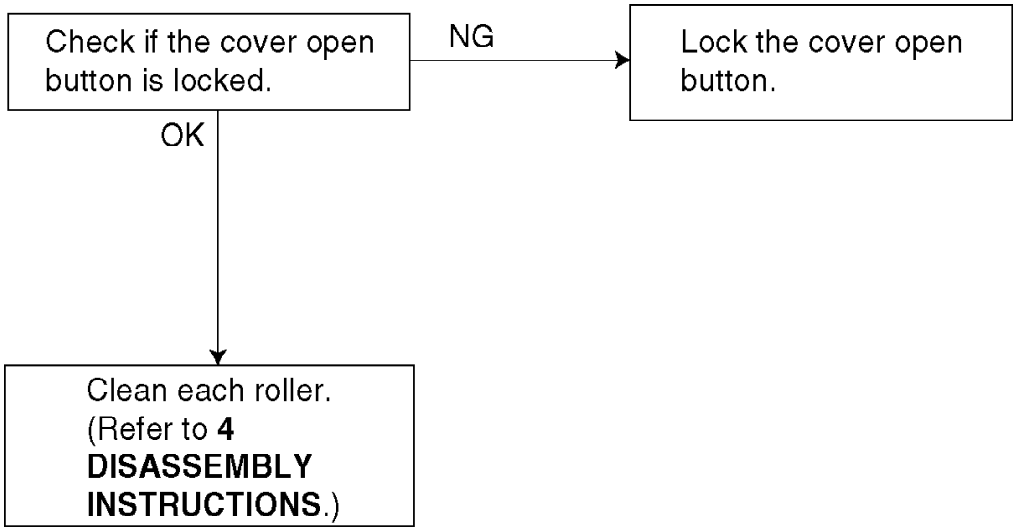


CROSS REFERENCE:
DIGITAL BOARD SECTION ()
TEST FUNCTIONS ()

3.3.4.7. SKEWED RECEIVING IMAGE

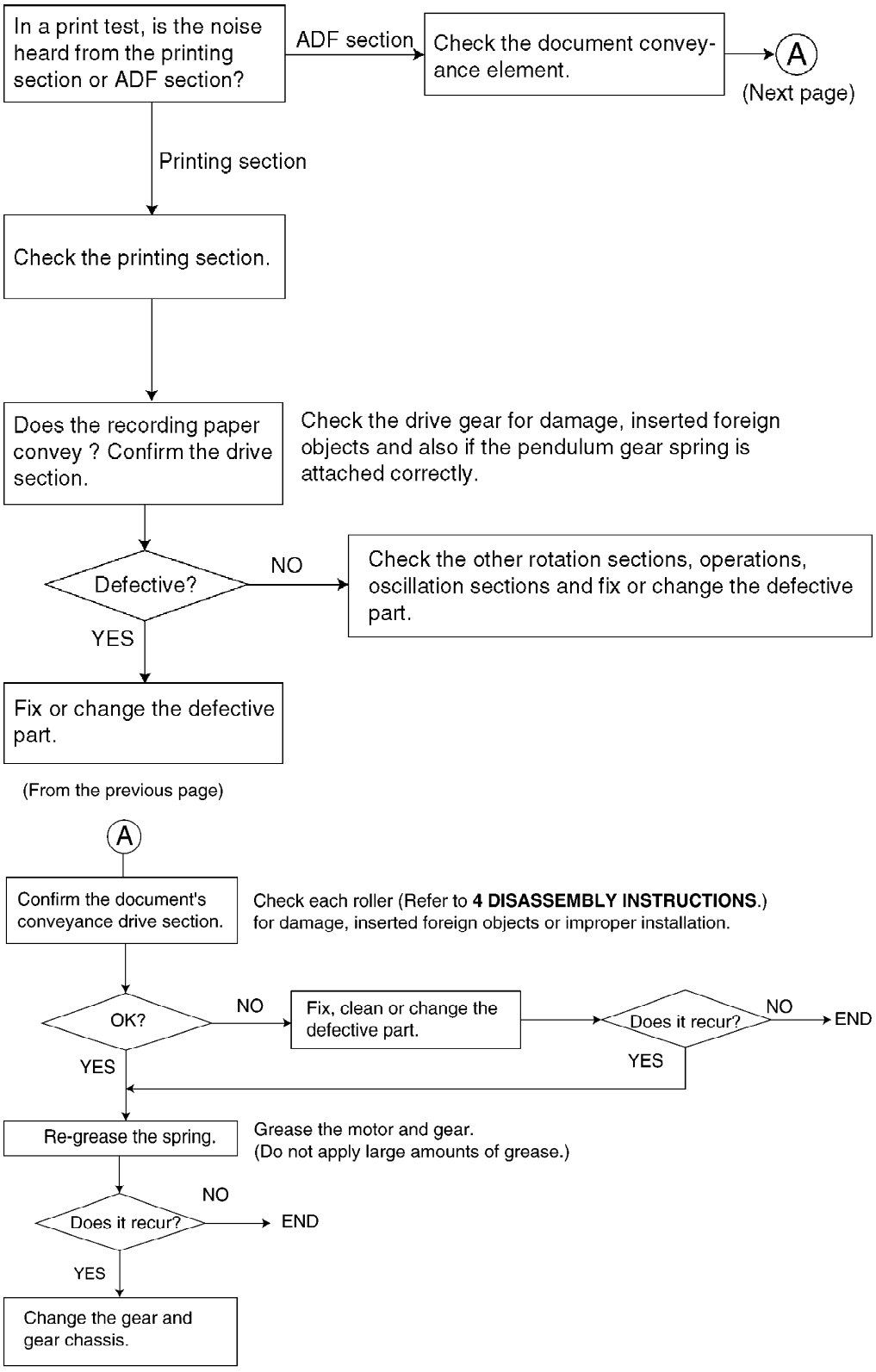


3.3.4.8. EXPANDER PRINT (WHEN PRINTING)



CROSS REFERENCE:
DISASSEMBLY INSTRUCTIONS ()

3.3.4.9. WHEN COPYING OR PRINTING, AN ABNORMAL SOUND IS HEARD FROM THE UNIT



CROSS REFERENCE:

DISASSEMBLY INSTRUCTIONS ()

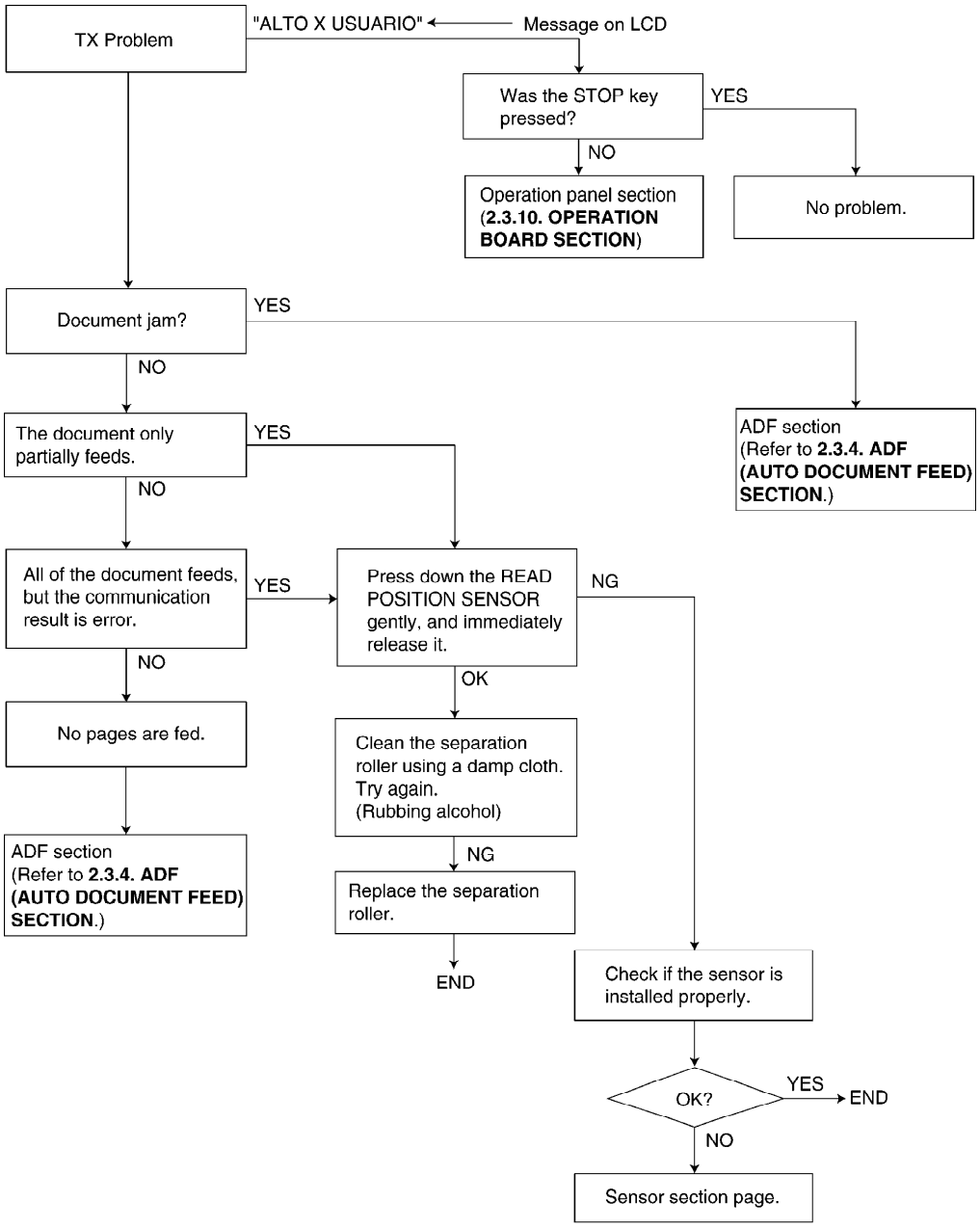
3.3.5. COMMUNICATION SECTION

Find the problem in the table shown below, and refer to the corresponding troubleshooting procedure in DEFECTIVE FACSIMILE SECTION ().

No.	Symptom	Content	Possible cause
1	The paper does not feed properly when faxing. (Copying is also not possible.)	Troubleshooting	Problem with the feeding mechanism.
2	The fax transmits successfully one time and fails another. (Copying is possible.)	Troubleshooting	Problem with the service line or the receiver's fax.
3	The fax receives successfully one time and fails another. (Copying is possible.)	Troubleshooting	Problem with the service line or the transmitter's fax.
4	The fax completely fails to transmit or receive. (Copying is possible.)	Troubleshooting	Problem with an electric circuit.
5	The fax fails either to transmit or receive when making a long distance or interna-tional call. (Copying is possible.)	Detailed description of the possible causes (Similar to troubleshooting items No.2 and No.3.)	Problem with the service line.
6	No.1-No.5	Troubleshooting procedure for each error code printed on the communication result report.	

3.3.5.1. DEFECTIVE FACSIMILE SECTION

3.3.5.1.1. TRANSMIT PROBLEM



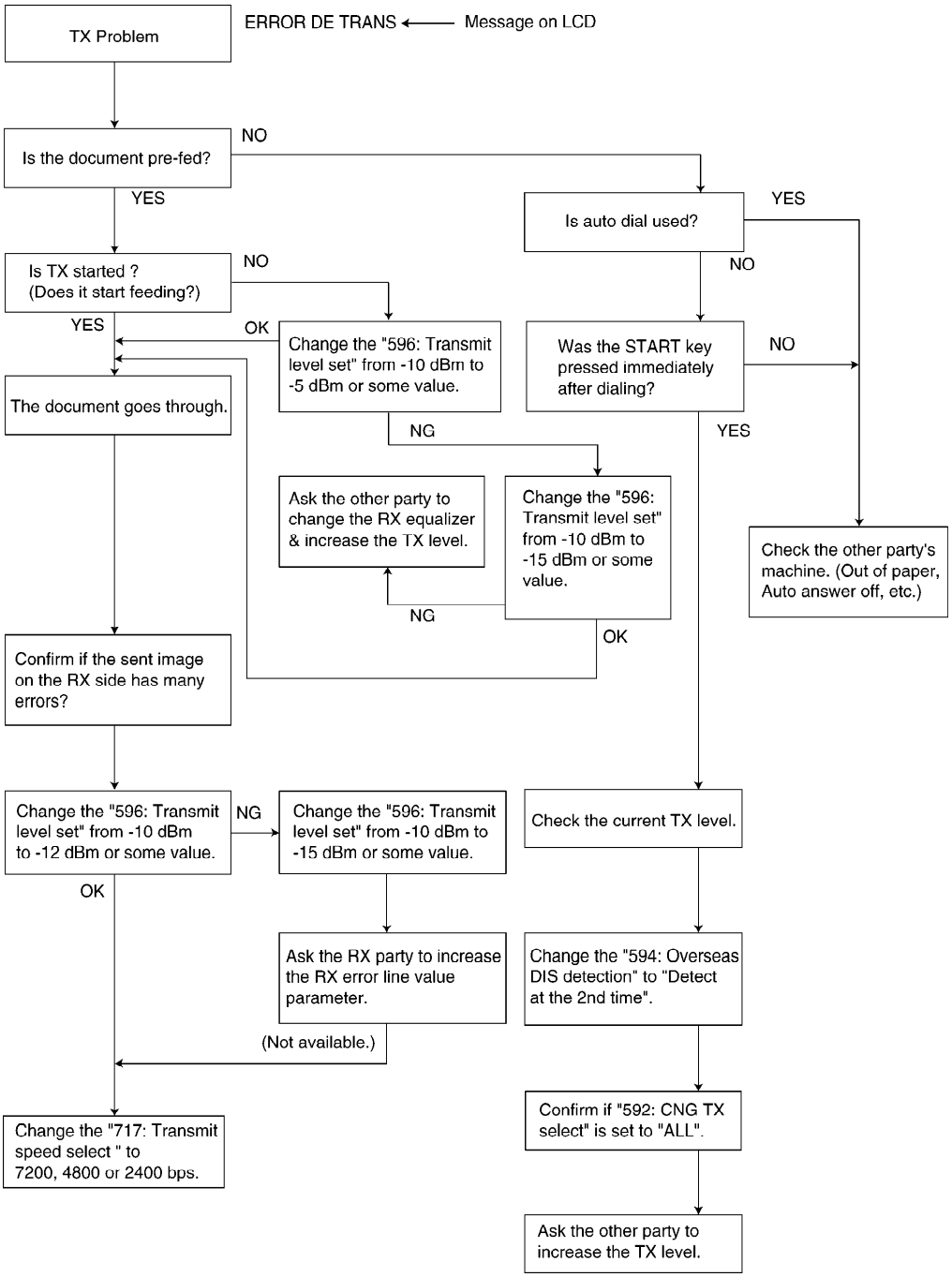
CROSS REFERENCE:

TRANSLATION LIST (ENGLISH,PORTUGUESE) ()

ADF (AUTO DOCUMENT FEED) SECTION ()

OPERATION BOARD SECTION ()

3.3.5.1.2. SOMETIMES THERE IS A TRANSMIT PROBLEM

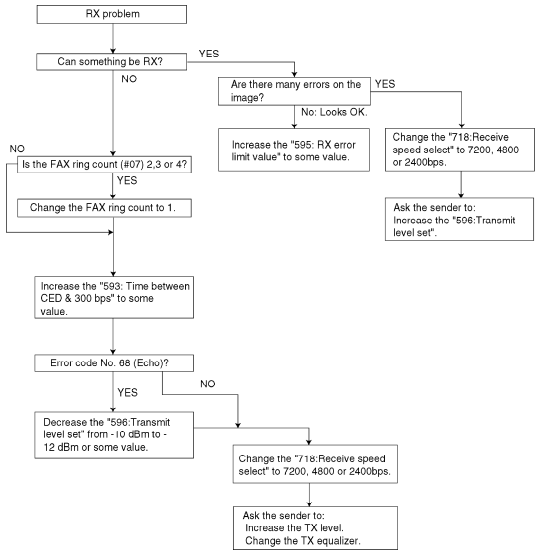


CROSS REFERENCE:
TRANSLATION LIST (ENGLISH,PORTUGUESE) ()

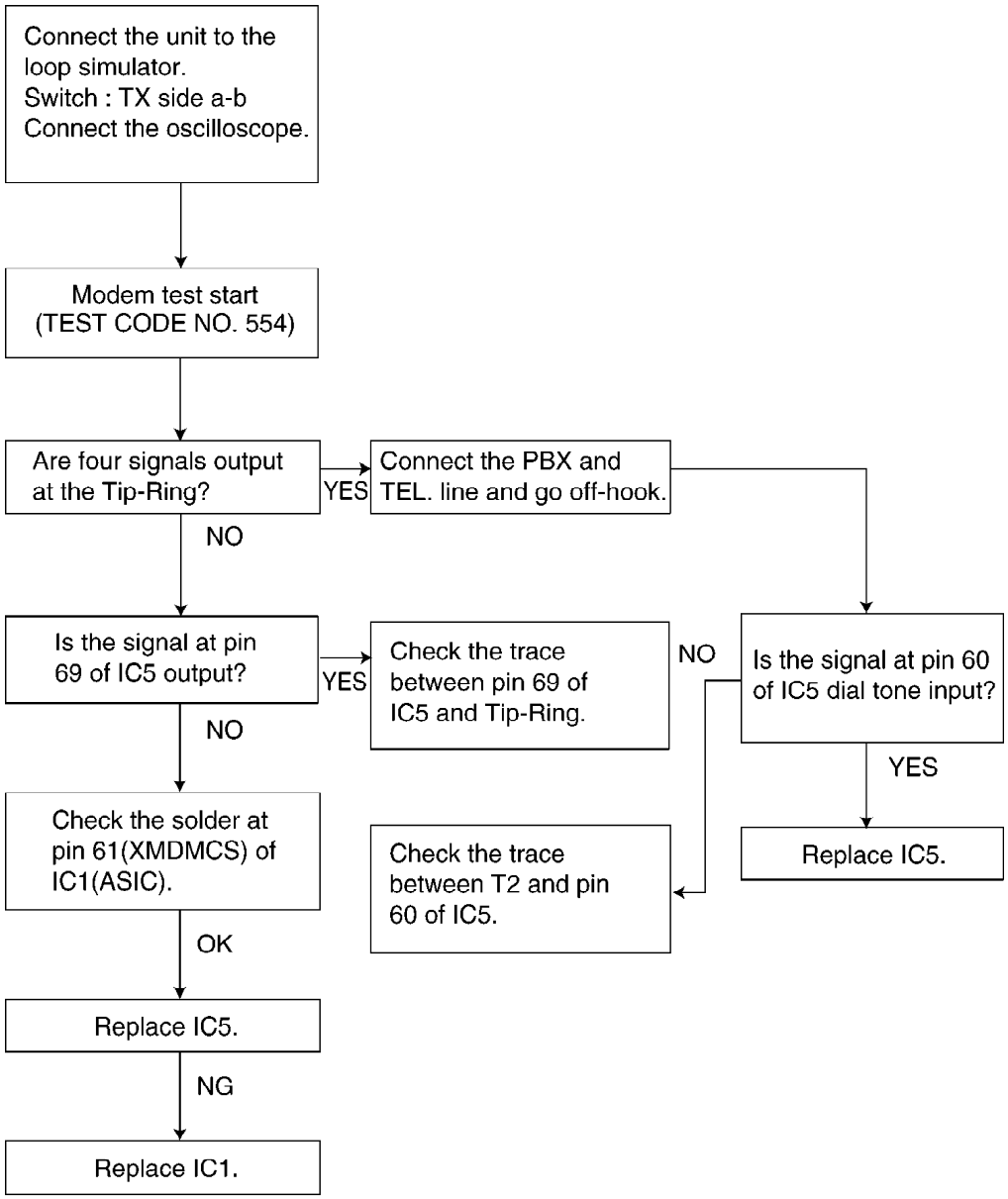
3.3.5.1.3. RECEPTION PROBLEM

Confirm the following before starting troubleshooting. / Is the recording paper installed properly?
There is the receiving problem when sometimes the below errors may be occurred.
SIN PAPEL / REVISAR LA TAPA / SOBRECALENTADO (If it doesn't return automatically, COVER OPEN, etc., reset the unit.) / REVISAR DOC

Please refer to USER RECOVERABLE ERRORS () for the above items. / Also, when a hardware deformity occurs, please check each sensor.



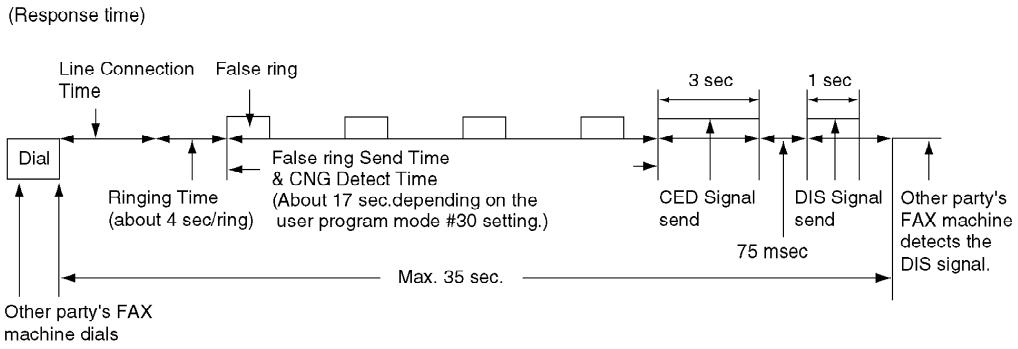
3.3.5.1.4. THE UNIT CAN COPY, BUT CANNOT TRANSMIT/RECEIVE



3.3.5.1.5. UNIT CAN COPY, BUT CANNOT TRANSMIT/RECEIVE LONG DISTANCE OR INTERNATIONAL COMMUNICATIONS

The following 2 causes can be considered for this.

Cause 1:
The other party is executing automatic dialling, the call has been received by this unit, and the CED or DIS signal response time is too long. (In most cases, this unit detects the CNG signal and can respond to the CED or DIS.) (According to the ITU-T standard, the communication procedure is stopped when there is no response from the other party within 35 sec, so that the other party releases the line.)

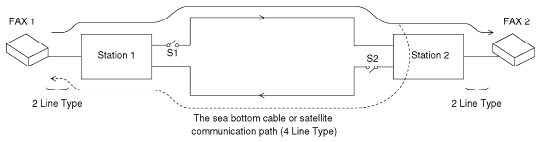


(Cause and Countermeasure)

As shown in the chart above, the total handshaking time must be reduced. Long distance connection and linking of several stations means the line connection time cannot be reduced. Accordingly, the following countermeasures should be attempted. / (A) The TEL/FAX DELAYED RING count should be 1. (User parameter: code No. 78) / (B) As the 35 sec. count starts directly after dialing or directly after the START button has been pressed for models with a START button, the other party should be called manually, if possible. / Another possibility is entering two pauses at the end of the auto dial number on the transmission side. Then the count start time will be delayed for 2 pauses (about 10 sec.).

Cause 2:

Erroneous detection due to an echo or echo canceler.



(Echo/Echo Canceler)

The signal from FAX1 reaches FAX2 via the stations 1 and 2, but the reflection signal at station 2 also returns via station 1(echo). As the distance between station 1 and station 2 is far, the echo returns to FAX 1 a max. of 600 msec after transmission. There is a possibility that this signal is detected erroneously as the signal from FAX2. For a normal call, there is a possibility that the echo of their own voice will make the call difficult to understand. For this reason, each station (station 1, station 2) attaches echo cancellers (S1, S2) for international lines or long distance lines. For the echo canceller, the level of the transmission signal from FAX 1 is compared with the level of the reception signal from FAX2. When the S1 is closed and S2 is open, so that the echo does not return to FAX1.

(Causes and Countermeasures)

(Cause A)

When a training signal is transmitted from FAX1 during the communication procedure at the time of transmission from FAX1 toFAX2, there is a delay until the echo canceler operates. S1 is closed so that a part of the head of the training signal may dropout. Normal reception by FAX2 may not be possible, and transmission may not be started.

(Countermeasure A)

When the international line mode is ON in the service mode (code No. 521), a dummy signal is attached to the head of the training signal to prevent this problem. As this normally is ON, it is necessary to reconfirm that this has not become OFF. When the international mode is switched

OFF, the transmission side will try the training signal three times at each speed (9600BPS, 7200BPS, 4800BPS and 2400BPS). If NG, it will drop the speed by one rank (fall-back). When the international mode is switched ON, each speed will be tried only twice. In other words, the slower speed with fewer errors can be accessed more easily. This is done because the line conditions may deteriorate and the picture may be affected more easily during communication for international lines or long distance communication, even when the training is OK. The default value is ON as preference is given to clearer pictures rather than speed.
(Cause B)
The echo canceller operation is stopped with a 2100Hz signal (i.e. S1 and S2 become ON). / Accordingly, when FAX1 has executed automatic reception, a CED signal is output. If this signal is 2100Hz, S1 and S2 will become ON. Then the echo of the DIS signal output afterwards may be received and FAX1 may execute an erroneous operation, preventing communication from starting.
(Countermeasure B)
In the service mode, the time setting between the CED signal and the DIS signal is set from 75 msec to 500 msec in the service mode (code No.593). This is because the echo canceller operation stop mode is cancelled by an interval of 250 msec or more. / Reduce receiving sensitivity to reduce the effect of RCV echo signal. (service mode: code No. 598)
(Cause C)
This model is FAX1 and the other party is FAX2. / For transmission from FAX1 to FAX2, FAX2 executes automatic reception and transmits a CED signal (2100 Hz) followed by a DIS signal. As the echo cancellers stops as described in cause B, the echo of the DIS signal returns to FAX2. On the other hand, FAX1 detects the DIS signal and transmits a DCS signal. In other words, it is possible that the echo of the DIS signal and the DCS signal transmitted from FAX1 reach FAX2 one after the other. FAX2 detects an error and communication is not started.
(Countermeasure C)
When the international DIS detection setting is set in the service mode (code No.594), FAX1 does not respond to the first DIS signal and returns a DCS signal only for the second DIS signal. / In other words, there is an interval of 250 msec between transmission of first and second DIS signal so that the echo cancellers operation recovers. An echo is not generated for the second DIS signal.

Note:
When the other FAX does not respond with a DCS signal after DIS signal transmission, the DIS signal is transmitted three times for trial.

Summary:
Long distance and international communication operation

SYMPTOM	COUNTERMEASURE
Does not receive in the automatic mode.	1. If possible, manual transmission should be made from the transmission side. 2. If possible, two pauses should be inserted at the end of the auto dial number on the transmission side. 3. If possible, the Function Selector Switch should be switched to FAX.
Does not transmit.	1. Confirm the international line mode is ON. (Service mode: code No. 521) 2. Enable the International DIS detection setting. (Service mode: code No. 594)
Does not receive.	1. Set the time setting between the CED signal and the DIS signal to 500 msec. (Service mode : code No. 593) 2. Reduce te RCV sensitivity. (Service mode : code No. 598)

3.3.5.1.6. THE UNIT CAN COPY, BUT THE TRANSMISSION AND RECEPTION IMAGE IS

INCORRECT

(Long distance or international communication operation)
This depends widely on the transmission and reception capability of the other FAX unit and the line conditions. / The countermeasures for this unit are shown below.

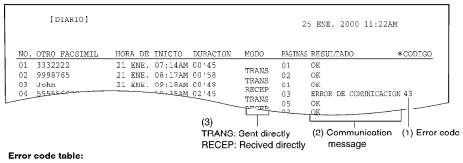
Transmission Operation:
Set the transmitting speed to 4800BPS (service mode: code No. 717) or select the overseas mode.

Reception Operation:
If 80% or more of the reception is incorrect, set the receiving speed to 4800BPS. (Service mode: code No. 718)

3.3.5.1.7. HOW TO OUTPUT THE JOURNAL REPORT:

a. Press the MENU button 2 times.
b. Rotate "EASY DIAL" until the "JOURNAL REPORT" is displayed.
c. Press the START/COPY/SET button.

Ejemplo de un informe de comunicaciones de la jornada



Error code table:

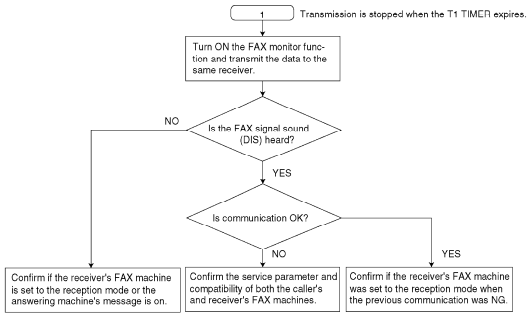
(1) CODE	(2) RESULT	(3) MODE	SYMPTOM	Counter-measure
	PRESSED THE STOP KEY (TECLA STOP PRESIONADA)	TRANS&RECP	Communication was interrupted by the STOP button.	
	DOCUMENT JAMMED (DOCUMENTO ATASCADO)	TRANS	The document paper is jammed.	
	NO DOCUMENT (NO HAY DOCUMENTO)	TRANS	No document paper.	
	PRINTER OVERHEATED (SOBRECALENTAMIENTO)	RECEP	The thermal head is overheated.	
	PAPER OUT (SIN PAPEL)	RECEP	Out of thermal paper or the cover is open.	
40	OTHER FAX NOT RESPOND (NO HAY RESPUESTA)	TRANS	Transmission is stopped when the T1 TIMER expires.	
41	COMMUNICATION ERROR (ERROR DE COMUNICACION)	TRANS	DCN is received after DCS transmission.	1
42	COMMUNICATION ERROR (ERROR DE COMUNICACION)	TRANS	FTT is received after transmission of 2400BSP training signal.	2
43	COMMUNICATION ERROR (ERROR DE COMUNICACION)	TRANS	No response after post message is transmitted three times.	3
44	COMMUNICATION ERROR (ERROR DE COMUNICACION)	TRANS	RTN and PIN are received.	4
46	COMMUNICATION ERROR (ERROR DE COMUNICACION)	RECEP	No response after FTT is transmitted.	5
48	COMMUNICATION ERROR (ERROR DE COMUNICACION)	RECEP	No post message.	6
49	COMMUNICATION ERROR (ERROR DE COMUNICACION)	RECEP	RTN is transmitted.	7
50	COMMUNICATION ERROR (ERROR DE COMUNICACION)	RECEP	PIN is transmitted (to PRI-Q).	8
51	COMMUNICATION ERROR (ERROR DE COMUNICACION)	RECEP	PIN is transmitted.	8
52	OTHER FAX NOT RESPOND (NO HAY RESPUESTA)	RECEP	Reception is stopped when the T1 TIMER expires.	8

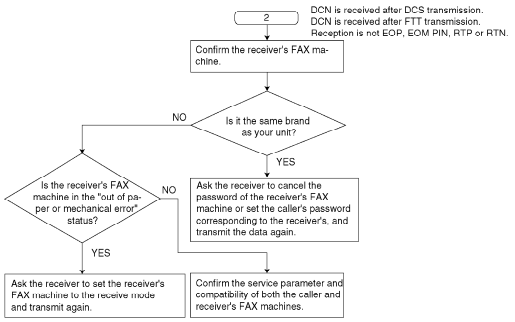
(1) CODE	(2) RESULT	(3) MODE	SYMPTOM	Counter-measure
53	ERROR-NOT YOUR UNIT (ERROR OTRA UNIDAD)	TRANS	DCN is received after transmission of NSC and DTC.	9
54	ERROR-NOT YOUR UNIT (ERROR OTRA UNIDAD)	RECEP	DCN is received after DIS transmission.	10
57	COMMUNICATION ERROR (ERROR DE COMUNICACION)	TRANS	300BPS error	11
58	COMMUNICATION ERROR (ERROR DE COMUNICACION)	RECEP	DCN is received after FTT transmission.	12
59	ERROR-NOT YOUR UNIT (ERROR OTRA UNIDAD)	TRANS	DCN responds to a post message.	13
64	COMMUNICATION ERROR (ERROR DE COMUNICACION)	TRANS	Polling is not possible.	14
68	COMMUNICATION ERROR (ERROR DE COMUNICACION)	RECEP	No response at the other party after MCF or CFR is transmitted.	15
70	ERROR-NOT YOUR UNIT (ERROR OTRA UNIDAD)	RECEP	DCN is received after CFR transmission.	13
72	COMMUNICATION ERROR (ERROR DE COMUNICACION)	RECEP	The carrier is cut when the image signal is received.	13
FF	COMMUNICATION ERROR (ERROR DE COMUNICACION)	TRANS & RECEP	Modem error.	12

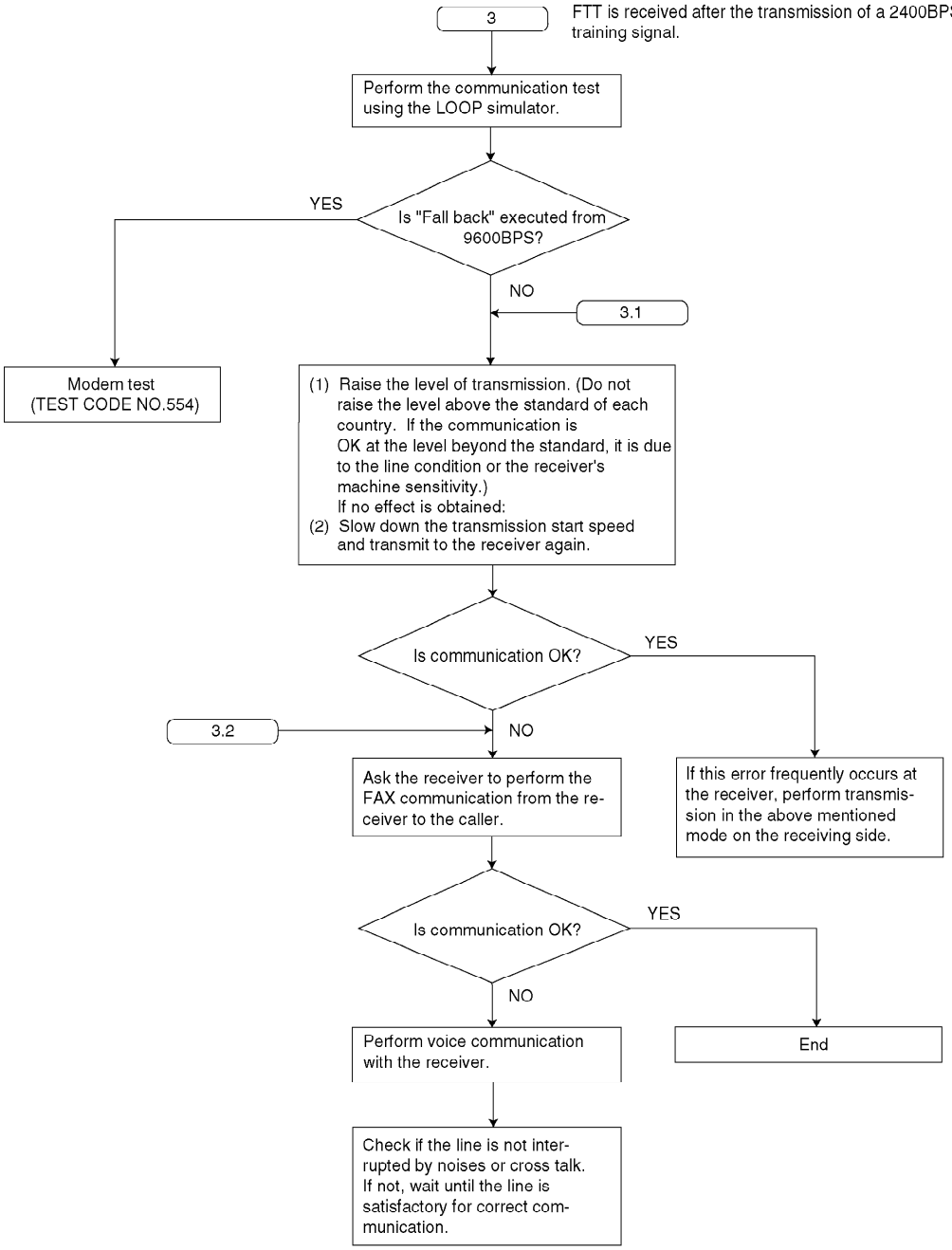
TRANS=TRANSMISSION RECEP=RECEPTION

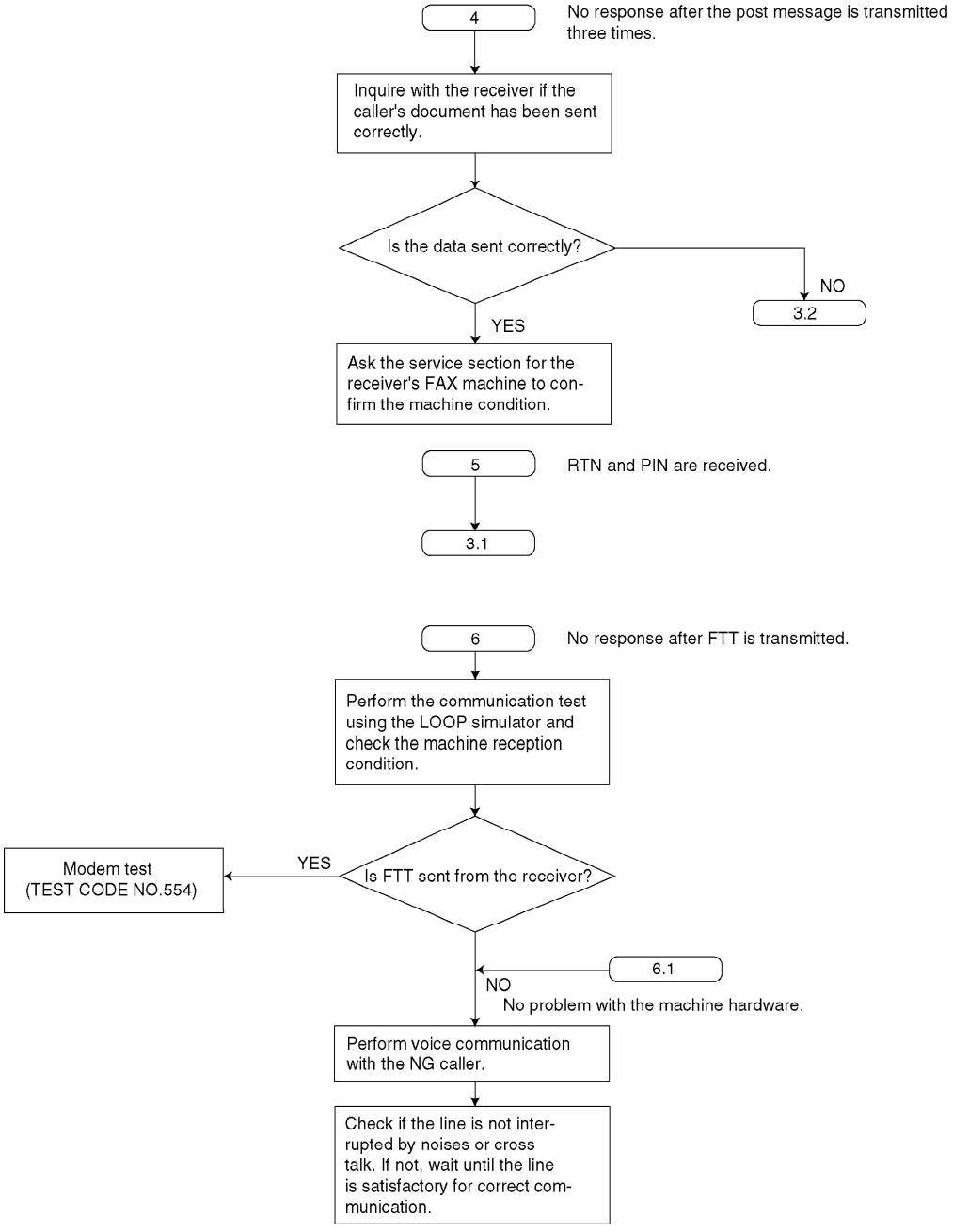
a. Change the TX speed/RX speed. (Service code: 717/718, refer to SERVICE FUNCTION TABLE ().)
b. Change the transmit level. (Service code: 596, refer to SERVICE FUNCTION TABLE ().)
If the problem remains, see the next page.

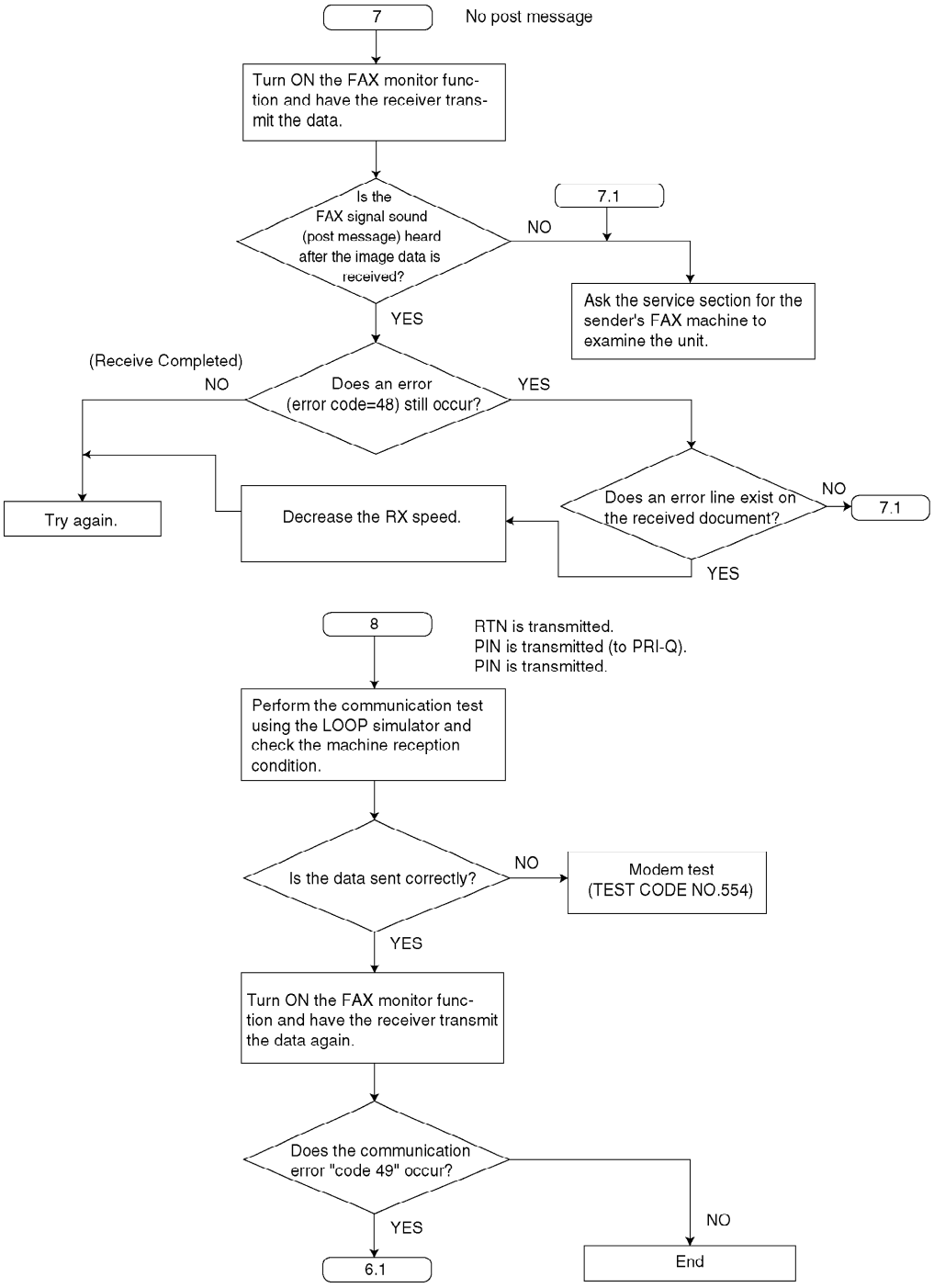
Countermeasure

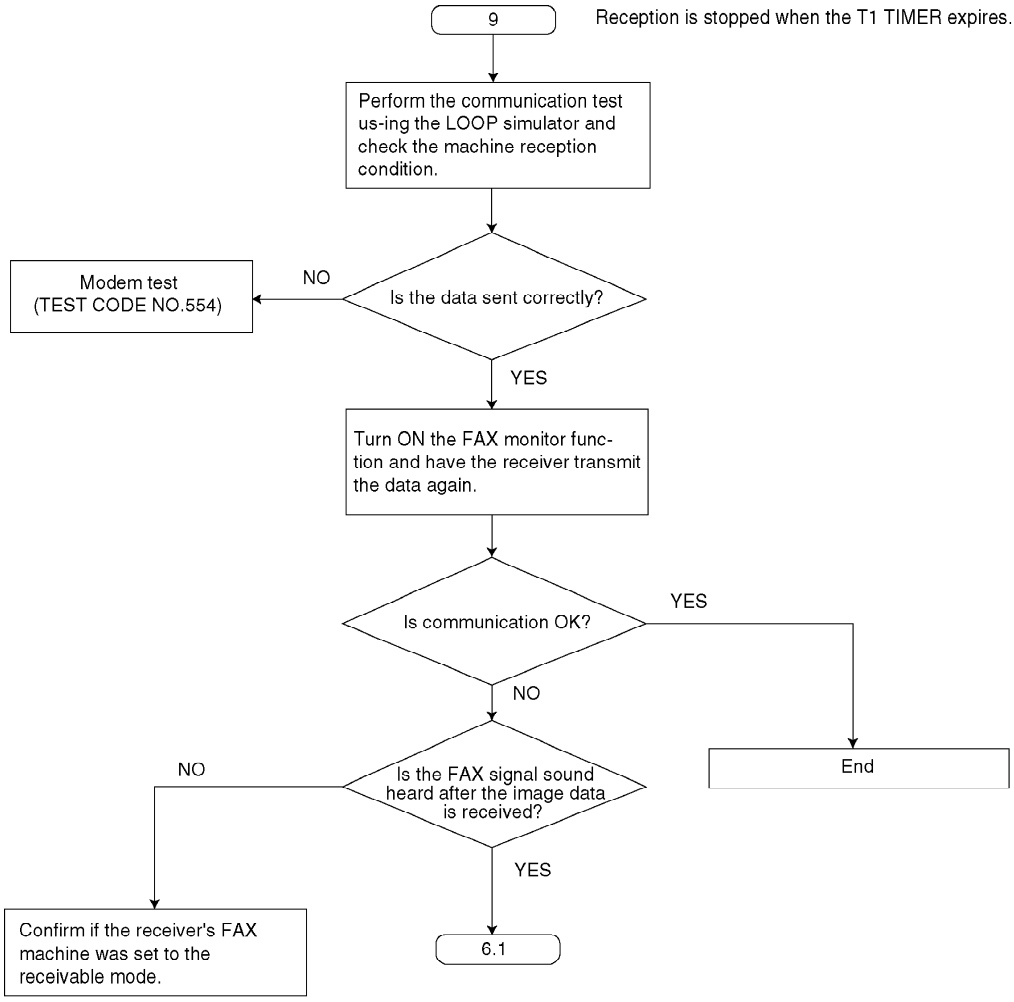


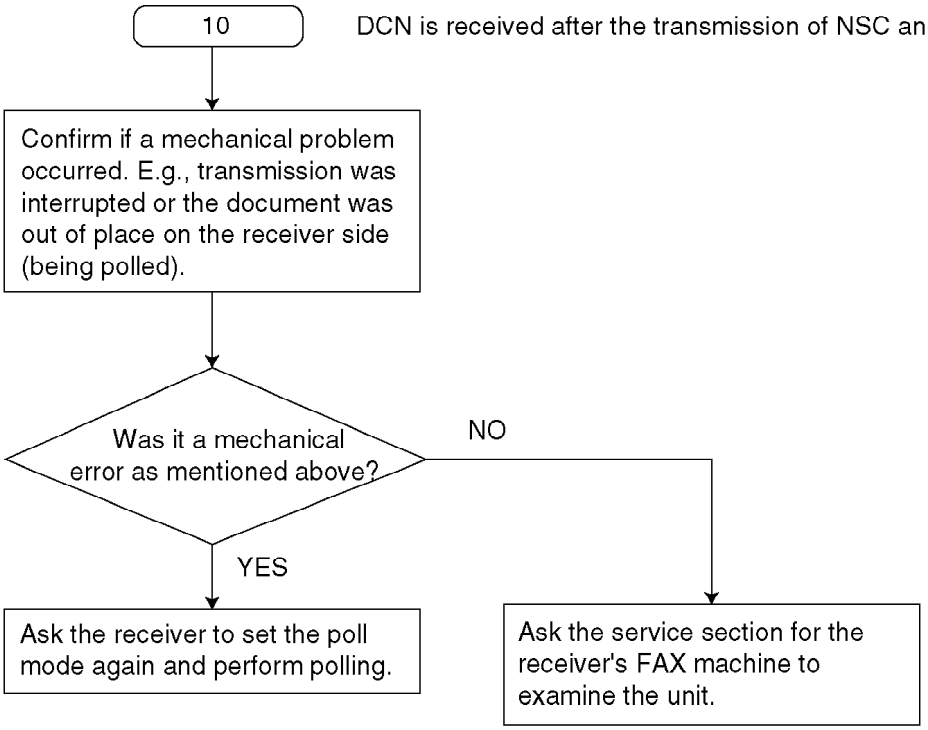


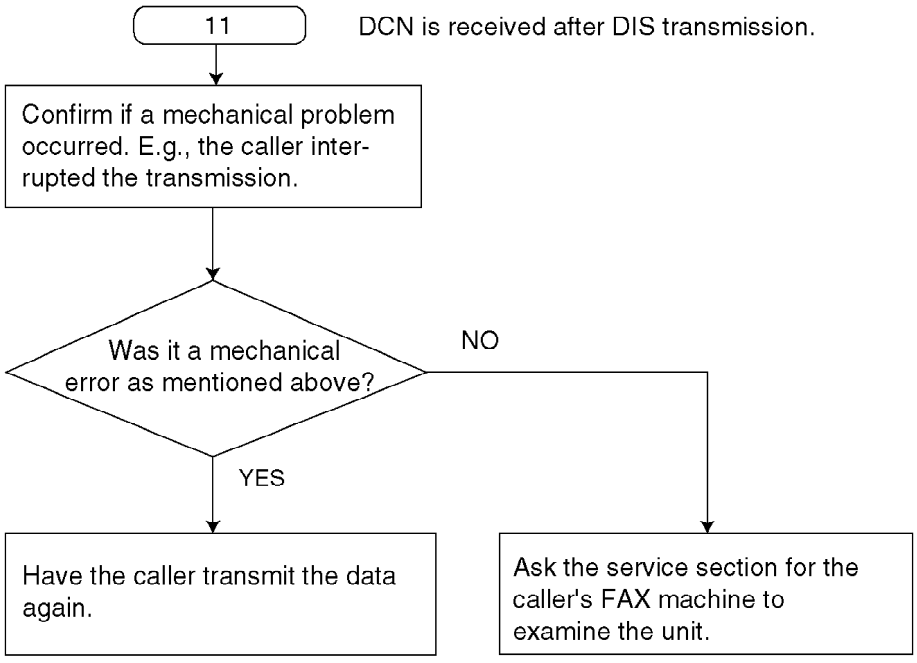

3
FTT is received after the transmission of a 2400BPS training signal.
Perform the communication test using the LOOP simulator.
YES
Is "Fall back" executed from 9600BPS?
NO
3.1
Modem test (TEST CODE NO.554)
(1) Raise the level of transmission. (Do not raise the level above the standard of each country. If the communication is OK at the level beyond the standard, it is due to the line condition or the receiver's machine sensitivity.)
If no effect is obtained:
(2) Slow down the transmission start speed and transmit to the receiver again.
Is communication OK?
YES
3.2
NO
Ask the receiver to perform the FAX communication from the receiver to the caller.
If this error frequently occurs at the receiver, perform transmission in the above mentioned mode on the receiving side.
Is communication OK?
YES
NO
Perform voice communication with the receiver.
End
Check if the line is not interrupted by noises or cross talk. If not, wait until the line is satisfactory for correct communication.

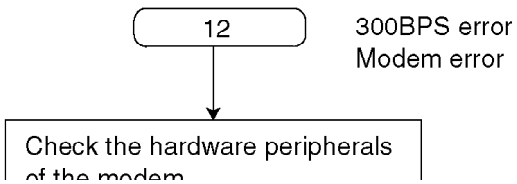

4
No response after the post message is transmitted three times.
Inquire with the receiver if the caller's document has been sent correctly.
Is the data sent correctly?
NO
3.2
YES
Ask the service section for the receiver's FAX machine to confirm the machine condition.
5
RTN and PIN are received.
3.1
6
No response after FTT is transmitted.
Perform the communication test using the LOOP simulator and check the machine reception condition.
Modem test (TEST CODE NO.554)
YES
Is FTT sent from the receiver?
6.1
NO
No problem with the machine hardware.
Perform voice communication with the NG caller.
Check if the line is not interrupted by noises or cross talk. If not, wait until the line is satisfactory for correct communication.


7
No post message
Turn ON the FAX monitor function and have the receiver transmit the data.
Is the FAX signal sound (post message) heard after the image data is received?
NO
7.1
Ask the service section for the sender's FAX machine to examine the unit.
YES
(Receive Completed)
NO
Does an error (error code=48) still occur?
YES
Does an error line exist on the received document?
NO
7.1
YES
Decrease the RX speed.
Try again.
8
RTN is transmitted.
PIN is transmitted (to PRI-Q).
PIN is transmitted.
Perform the communication test using the LOOP simulator and check the machine reception condition.
Is the data sent correctly?
NO
Modem test (TEST CODE NO.554)
YES
Turn ON the FAX monitor function and have the receiver transmit the data again.
Does the communication error "code 49" occur?
NO
YES
End
6.1

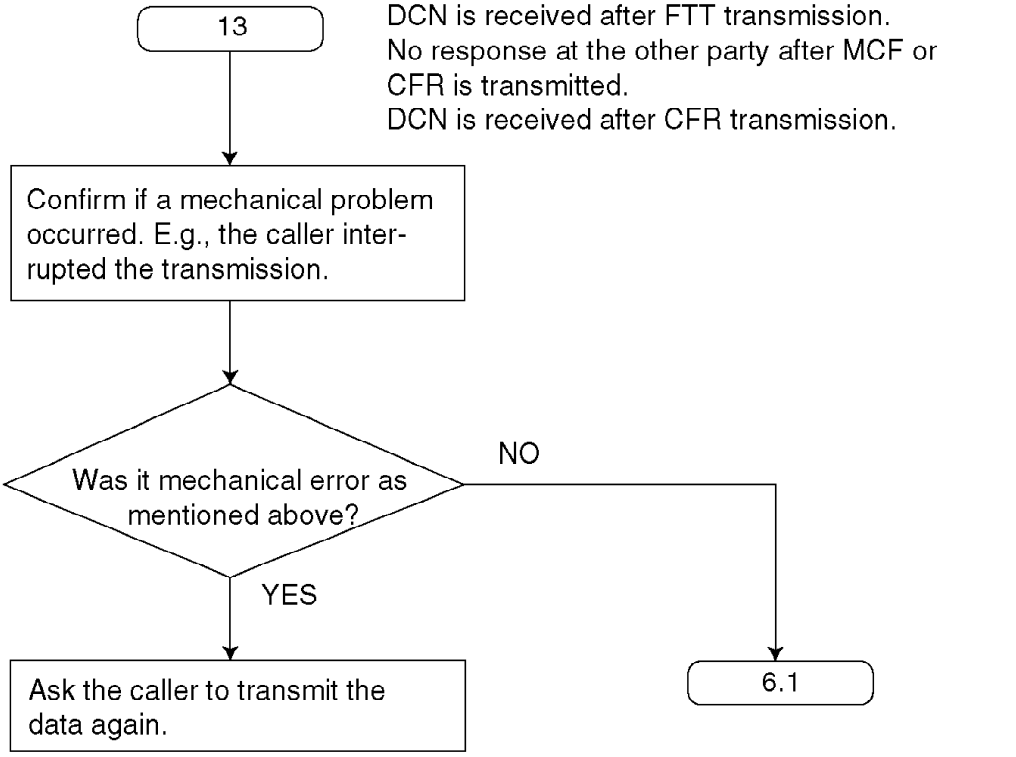

9
Reception is stopped when the T1 TIMER expires.
Perform the communication test us-ing the LOOP simulator and check the machine reception condition.
Is the data sent correctly?
NO
Modem test
(TEST CODE NO.554)
YES
Turn ON the FAX monitor func-tion and have the receiver transmit the data again.
Is communication OK?
YES
End
NO
Is the FAX signal sound heard after the image data is received?
NO
YES
Confirm if the receiver's FAX machine was set to the receivable mode.
6.1

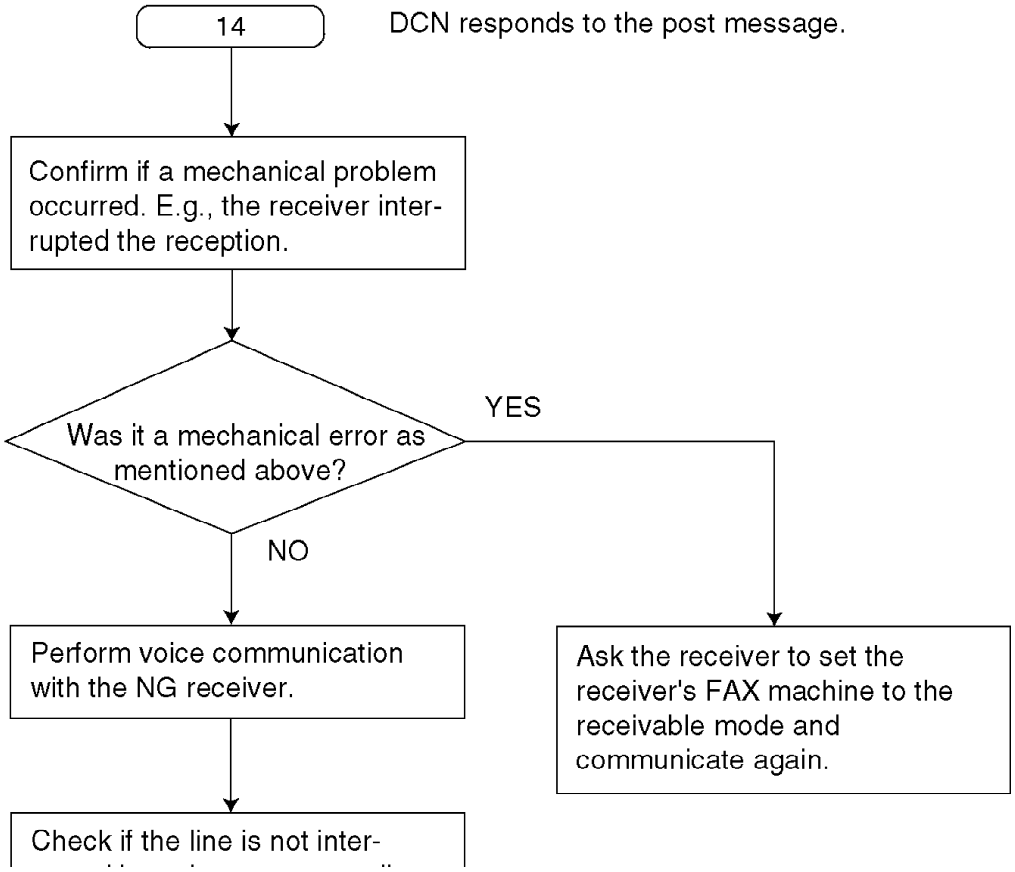

10
DCN is received after the transmission of NSC and DTC.
Confirm if a mechanical problem occurred. E.g., transmission was interrupted or the document was out of place on the receiver side (being polled).
Was it a mechanical error as mentioned above?
NO
YES
Ask the receiver to set the poll mode again and perform polling.
Ask the service section for the receiver's FAX machine to examine the unit.


11
DCN is received after DIS transmission.
Confirm if a mechanical problem occurred. E.g., the caller interrupted the transmission.
Was it a mechanical error as mentioned above?
NO
YES
Have the caller transmit the data again.
Ask the service section for the caller's FAX machine to examine the unit.

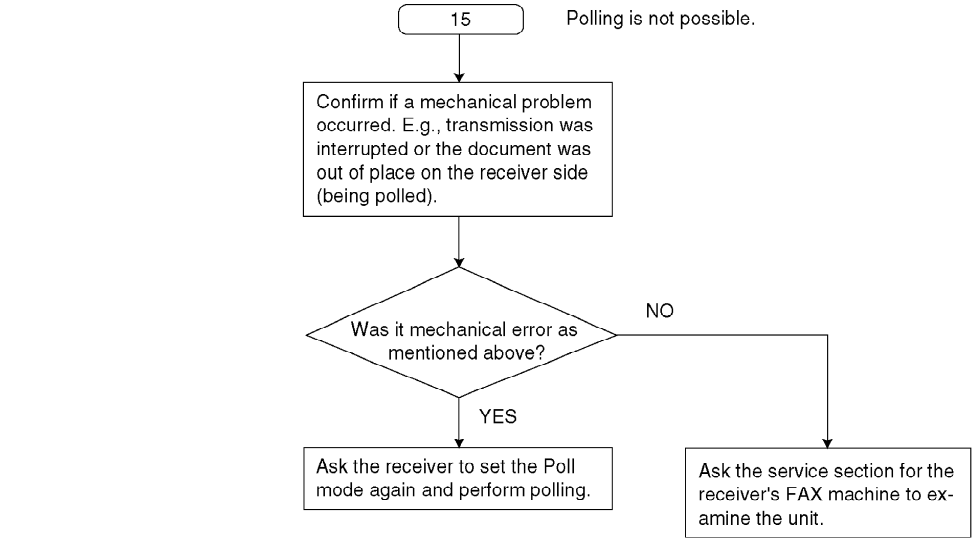

12
300BPS error
Modem error
Check the hardware peripherals

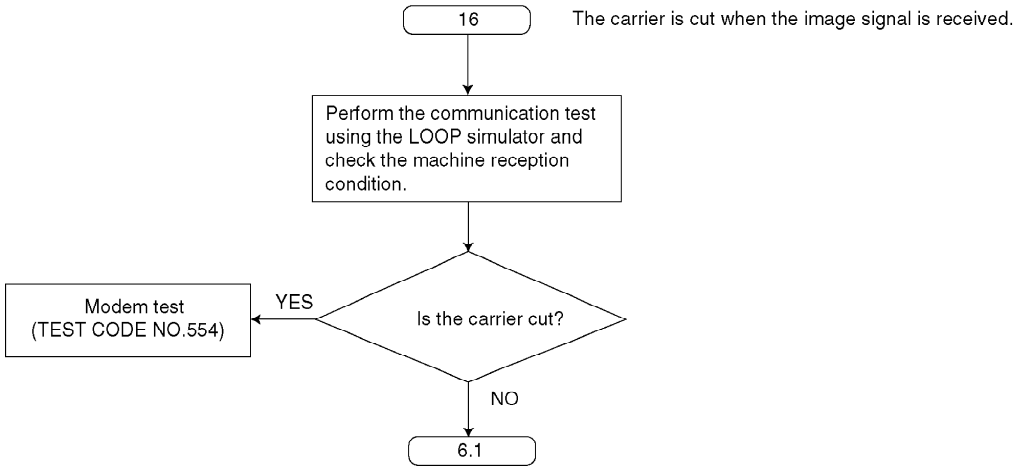
of the modem.


13
DCN is received after FTT transmission.
No response at the other party after MCF or CFR is transmitted.
DCN is received after CFR transmission.
Confirm if a mechanical problem occurred. E.g., the caller interrupted the transmission.
Was it mechanical error as mentioned above?
NO
YES
Ask the caller to transmit the data again.
6.1


14
DCN responds to the post message.
Confirm if a mechanical problem occurred. E.g., the receiver interrupted the reception.
Was it a mechanical error as mentioned above?
YES
NO
Perform voice communication with the NG receiver.
Ask the receiver to set the receiver's FAX machine to the receivable mode and communicate again.
Check if the line is not inter-

rupted by noises or cross talk. If not, wait until the line is satisfactory for correct communication.





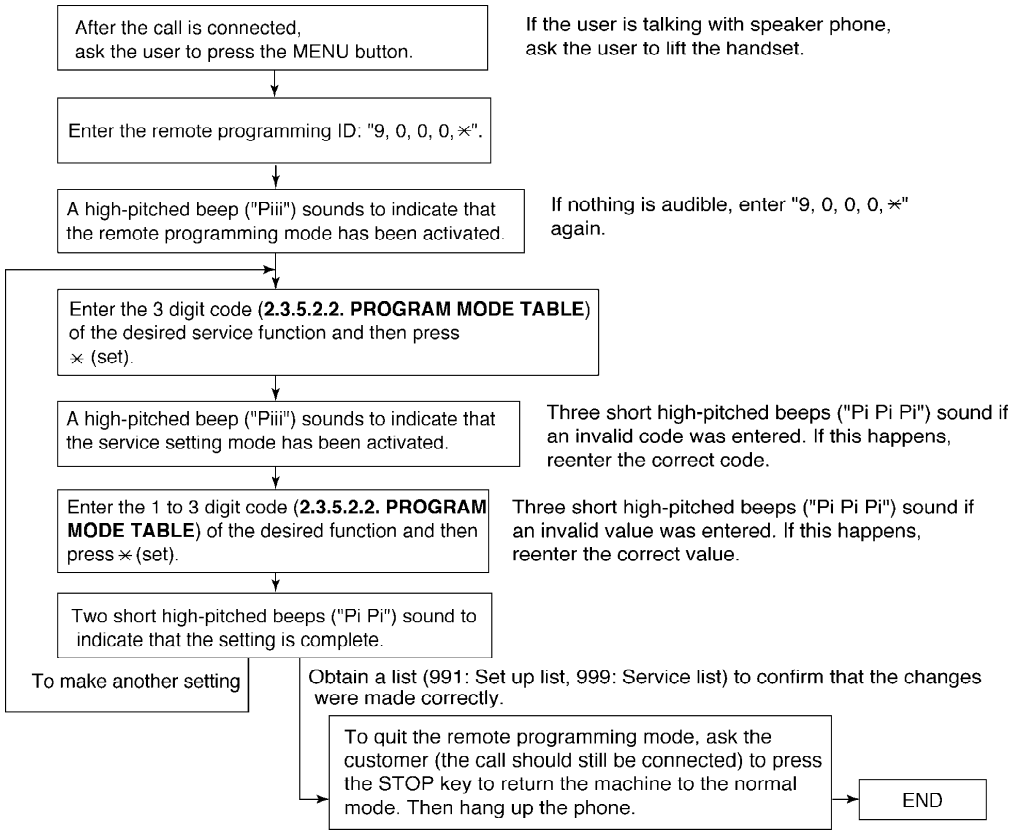
3.3.5.2. REMOTE PROGRAMMING

If, after the call is connected, the customer describes the situation and it is determined that the problem can be corrected by making parameter changes, this function makes it possible to change parameters such as the user code and service code from another fax (using DTMF tones). Therefore, travel to the customer's location is not required. However, it is not possible to change all the parameters remotely (Refer to PROGRAM MODE TABLE ()). The function used to accomplish this is remote programming.
First, in order to check the current status of the service code parameter, out put the setup list (code: 991) and service list (code: 999) from the customer's fax machine. Based on this, the parameters for the desired codes can be changed. The procedure for changing and listing parameters is described on ENTERING THE REMOTE PROGRAMMING MODE AND CHANGING

SERVICE CODES (). Also, before exiting the remote programming mode, it is advisable to obtain a new list to confirm that only the desired parameters were changed.

Hint:
Since the connected telephone is in use during the remote programming mode, it may be helpful to ask the customer to switch to the speakerphone (except for a digital speakerphone). This frees the customer from the need to remain right next to the fax while you are making parameter settings. When finished, inform the customer. Also note that in very noisy locations where the DTMF tones are not audible, the remote programming function will not work.

3.3.5.2.1. ENTERING THE REMOTE PROGRAMMING MODE AND CHANGING SERVICE CODES



CROSS REFERENCE:
PROGRAM MODE TABLE ()

3.3.5.2.2. PROGRAM MODE TABLE

Code	Function	Set Value	Default	F
001	Set the date and time	dd/mm/yy hh:mm AM/PM	---------	
002	Your logo	---------	---------	
003	Your telephone number	---------	---------	
004	Print transmission report	ERROR/ON/OFF	ERROR	
005	Auto receive mode	TAD/FAX/FAX ONLY/TEL/ FAX	TAD/FAX	
006	TAD/FAX ring count	1~4:TOLL SAVER/RINGER OFF	1	
007	FAX ring count	1 to 4 rings	1 ring	
009	TEL/FAX delayed ring	1 to 4 rings	1 ring	
010	Recording time	VOX/1 MIN	VOX	
011	Remote ANS ID	---------	ID=111	
013	Dialing mode	TONE/PULSE	TONE	
022	Journal auto print	ON/OFF	ON	
023	Overseas mode	ON/OFF	OFF	
025	Delayed send	ON/OFF	OFF	
030	Silent FAX recognition ring	3 to 9 rings	3 rings	
031	Ring detection	A/B/C/D/OFF	OFF	
039	LCD contrast	NORMAL/DARKER	NORMAL	
041	FAX activation code	ON/OFF	ON/ID=*9	
042	Message alert	ON/OFF	OFF	
043	REC. time alert	ON/OFF	OFF	
046	Friendly reception	ON/OFF	ON	
047	Voice guidance	ON/OFF	ON	
049	Auto disconnect	ON/OFF	ON/ID=*0	
054	Common greeting MSG. REC. time	16s/60s	16s	
058	Original setting	NORMAL/LIGHT/DARKER	NORMAL	
060	Message transfer	ON/OFF	OFF	
061	Transfer greeting	CHECK/RECORD/ERASE	CHECK	
067	ICM monitor	ON/OFF	ON	
070	FAX pager	ON/OFF	OFF	
076	Connecting tone	ON/OFF	ON	
080	Set the default	YES/NO	NO	
501	Pause time set	001~600 X 100 msec	050	
502	Flash time set	01~99 X 10 msec	70	
503	Dial speed set	1:10pps 2:20 pps	10	
510	Vox time	1:6sec 2:4sec	6sec	
520	CED frequency select	1:2100Hz 2:1100Hz	2100	
521	International mode select	1:ON 2:OFF	ON	
522	Auto standby select	1:ON 2:OFF	ON	
523	Receive equalizer select	1:0km 2:1.8km 3:3.6km 4: 7.2km	0km	
524	Transmission equalizer select	1:0km 2:1.8km 3:3.6km 4: 7.2km	0km	

Code	Function	Set Value	Default	F
533	Setting the number of times that message transfer is redialled.	00~99	03	
534	Setting of the message transfer/pager call redial interval	001~999	030	
544	Document feed position adjustment value set	01~99 step	---------	
550	Memory clear	Press "START".	---------	
551	ROM check	Press "START".	---------	
552	DTMFsignal tone test	1:ON 2:OFF	OFF	
553	Monitor on FAX communication select	1:OFF 2:P-B 3:ALL	OFF	
554	Modem test	Press "START".	---------	
555	Scanner test	Press "START".	---------	
556	Motor test	Press "START".	---------	
557	LED test	Press "START".	---------	
558	LCD test	Press "START".	---------	
559	Document jam detection select	1:ON 2:OFF	ON	
560	Cutter selection	1:ON 2:OFF	ON	
561	Key test	Press any key.	---------	
562	Cutter test	"START" push	---------	
570	Break % select	1:61% 2:67%	61%	
571	ITS auto redial time set	00~99	14	
572	ITS auto redial line disconnection time set	001~999 set	030	
573	Remote turn-on ring number set	01~99	15	
580	TAM continuous tone detection	1:ON/2:OFF	ON	
590	FAX auto redial time set	00~99	05	
591	FAX auto redial line disconnection time set	001~999	045	
592	CNG transmit select	1:OFF/2:ALL/3:AUTO	ALL	
593	Time between CED and 300 bps	1:75/2:500/3:1s	75 ms	
594	Overseas DIS detection select	1:1st/2:2nd	1st	
595	Receive error limit value set	001~999	100	
596	Transmit level set	15~00dBm	-10	
598	Receiving Sensitivity	20~48	40	
717	Transmit speed select	1:9600/2:7200/3:4800/4: 2400bps	9600bps	
718	Receive speed select	1:9600/2:7200/3:4800/4: 2400bps	9600bps	
719	Ringer off in TEL/FAX mode	1:ON/2:OFF	ON	
721	Pause tone detect	1:ON/2:OFF	ON	
722	Redial tone detect	1:ON/2:OFF	ON	
731	CPC mode	1:A / 2:B / 3:OFF	A	
763	Friendly reception CNG detection select	1:10S/2:20S/3:30S	20S	
771	T1 timer	1:35 sec/2:60 sec	35 sec	
774	T4 timer	00~99 X 100ms	00	
775	Monitoring of message transfer	1:ON/2:OFF	OFF	
815	Sensor check	Press "START".	---------	

Code	Function	Set Value	Default	F
841	Digital SP-Phone RX & TX check	1: SP-Phone	---------	
882	Journal 3	1: START	---------	
991	Transmit basic list	1: START	---------	
992	Transmit advanced list	1: START	---------	
994	Transmit journal report	1: START	---------	
999	Transmit service list	1: START	---------	

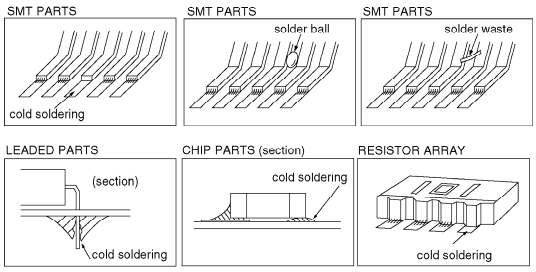
OK : Can set the value by the remote programming feature or print a list.
NG : Cannot set the value.

Note:
Note: Refer to SERVICE FUNCTION TABLE () for descriptions of the individual codes.

For example, the "004 Transmission report mode" set value "1:ERROR/2:ON/3:OFF" number corresponds to the number dialled.

3.3.6. DIGITAL BOARD SECTION

One of most difficult problems to deal with is when the system will not boot up.
The symptom: No response when the power is turned on. (No LCD display, keys are not accepted.)



Note:

1. **Electrical continuity may have existed at the factory check, but a faulty contact occurred as a result of vibration, etc., during transport.**
2. **Solder waste remaining on the board may get caught under the IC during transport, causing a short circuit.**

Before we begin mass production, several hundred trial units are produced at the plant, various tests are applied and any malfunctions are analyzed. (In past experiences, digital IC (especially SRAM and ROM) malfunctions are extremely rare after installation in the product.) / This may be repaired by replacing the IC, (ASIC etc.). However, the real cause may not have been an IC malfunction but a soldering fault instead. / Soldering faults which are difficult to detect with the naked eye are common, particularly for an ASIC and RA (Resistor Array). But if you have an

oscilloscope, you can easily determine the problem site or IC malfunction by checking the main signal lines. / Even if you don't have such a measuring instrument, by checking each main signal line and resoldering it, in many cases the problem will be resolved. / An explanation of the main signals (for booting up the unit) is below.

Don't exchange ICs or stop repairing until checking the signal lines.
An IC malfunction rarely occurs. (By understanding the necessary signals for booting up the unit, the "Not Boot up" display is not a serious problem.)

What are the main signals for booting up the unit?
Please refer to the DIGITAL BLOCK DIAGRAM (). / The ASIC (including the CPU) (IC1) controls all the other digital ICs. When the power is turned on, the ASIC (CPU) retrieves the operation code stored in the ROM (IC2), then follows the instructions for controlling each IC. All ICs have some inner registers that are assigned to a certain address. / It is the address bus by which the ASIC (CPU) designates the location inside each IC. And the data bus reads or writes the data in order to transmit the instructions from the ASIC (CPU) to the ICs. / These signal lines are all controlled by voltages of 5V (H) or 0V (L).

3.3.6.1. DIGITAL BLOCK DIAGRAM

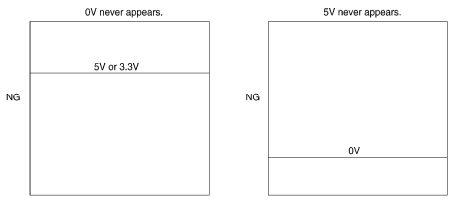
The signal lines that must be normal for the system to boot up are listed here [List 1]. / For signal lines other than these, even if they malfunction they do not directly affect booting up the system.

[List 1]

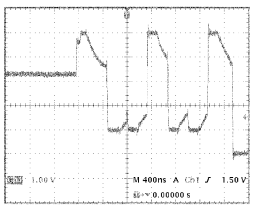
(1)	D0–D7	(Data Bus)
(2)	A0–A12, RBA0–RBA5	(Address Bus)
(3)	$\overline{RD}$	(Read Signal)
(4)	$\overline{ROMCS}$	(ROM Select Signal)
(5)	$\overline{WR}$	(Write Signal)
(6)	$\overline{RAMCS}$	(SRAM Select Signal)
(7)	$\overline{MDMCS}$	(MODEM Select Signal)

If these signals are normal, once the power is turned on, each IC repeatedly outputs 5V or 3.3V (H) and 0V (L). The following page shows NG and normal wave patterns.

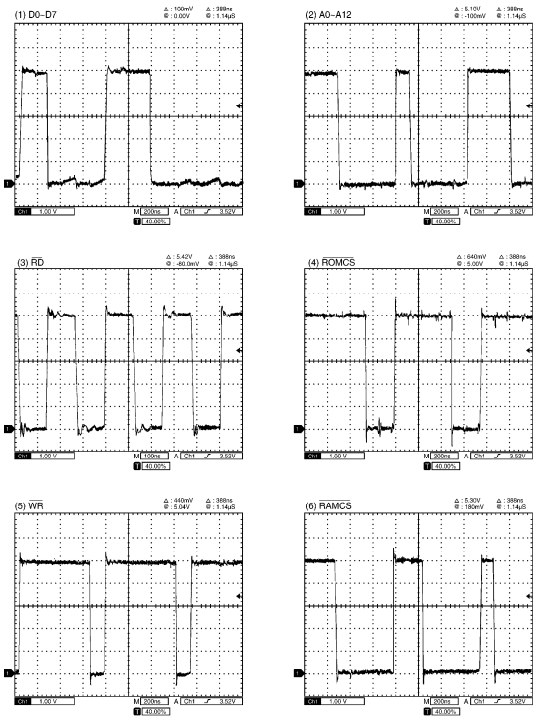
NG Wave pattern (Refer to NG EXAMPLE)

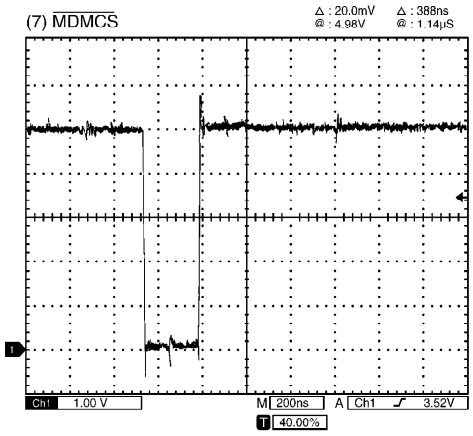


For a short between D0 and D1



Normal Wave Patterns

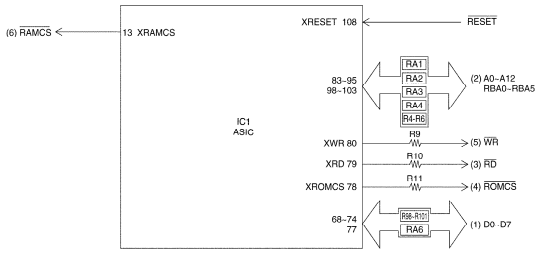


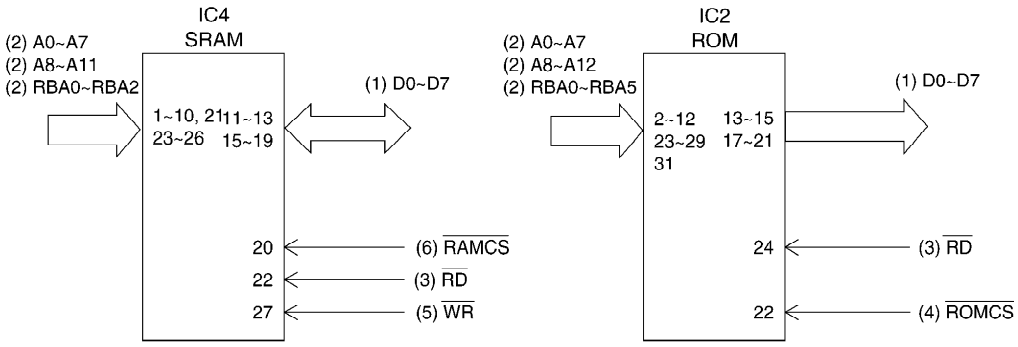


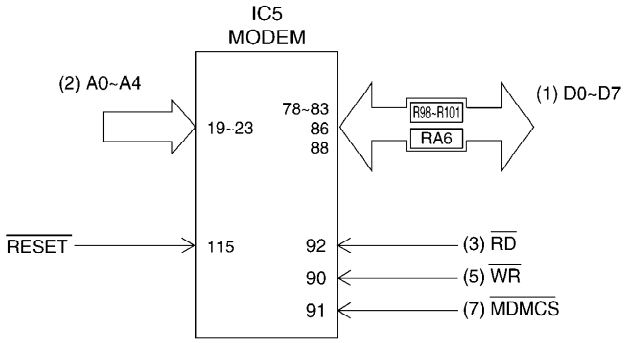
For these reasons and the software sequence to boot up the unit, if you use an oscilloscope to judge whether a signal is OK or NG, you must check in the same order as in [List 1]. (If the ASIC (CPU) failed to access the ROM, the ASIC cannot access the SRAM normally.)
The digital circuit actually operates according to the timing combinations of these signals. So, if the timing of these signals is even slightly off, the circuit will not operate normally. Even of the IC did malfunction, the output voltage level may become abnormal but the timing is accurate according to the specifications. (If oscillation is provided accurately.) / Accordingly, the problem presented here is whether each IC outputs the correct signal. (See the I/O and Pin No. diagram.) In other words, is it constantly switching between 5V or 3.3V (H) and 0V (L) as described earlier.

All you have to do is check that the IC repeatedly outputs (H) 5V or 3.3V and (L) 0V.

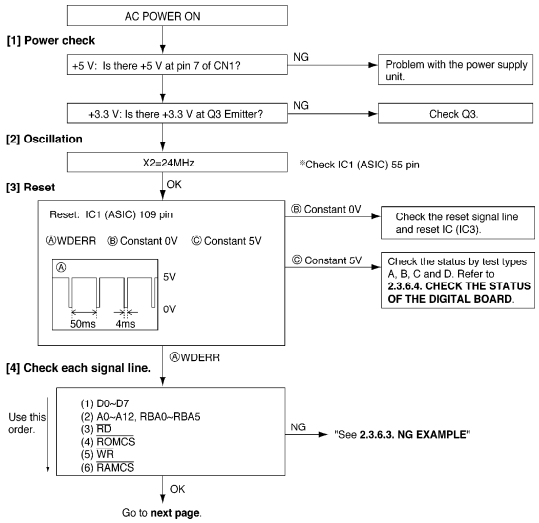
I/O and Pin No. Diagram



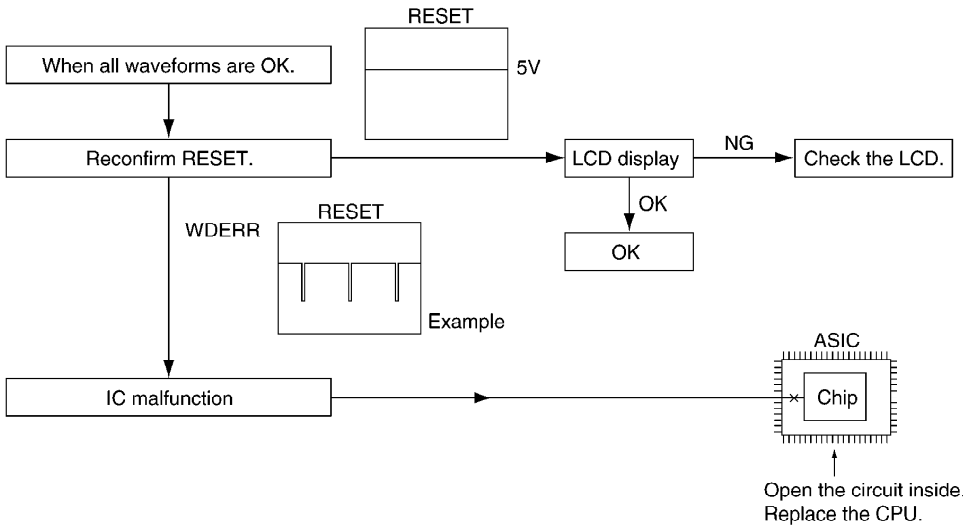




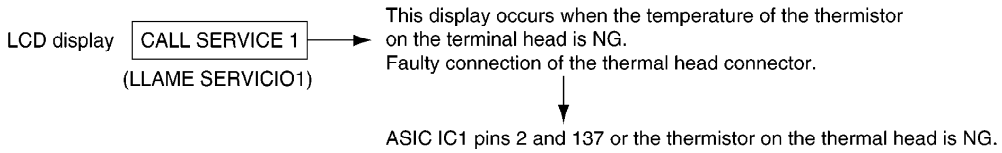
After the power is turned on, the ASIC (CPU) initializes and checks each IC.
The ROM, SRAM, and Modem are checked.
If initialization fails for the ICs, the system will not boot up.



CROSS REFERENCE:
NG EXAMPLE ()
CHECK THE STATUS OF THE DIGITAL BOARD ()

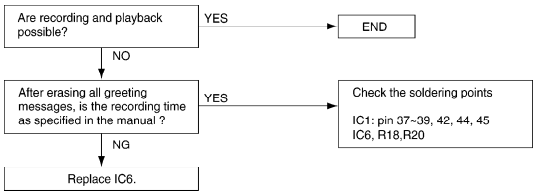


Other NG examples while the power is ON and the LCD displays the following.



3.3.6.2. FLASH MEMORY (IC6)

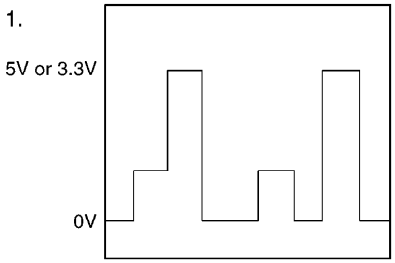
If the unit is working correctly but the VOICE GUIDANCE (voice prompt) is not heard, you should check the Flash Memory.

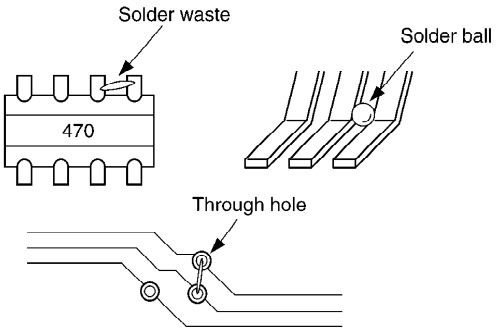


3.3.6.3. NG EXAMPLE

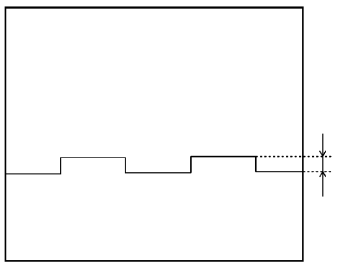
Short circuit from the adjacent signal wires.
Check for a short circuit in the RA and IC leads and the signal wire at the through hole.

1.

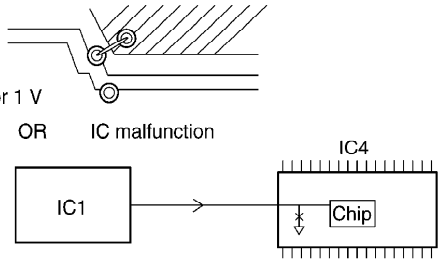




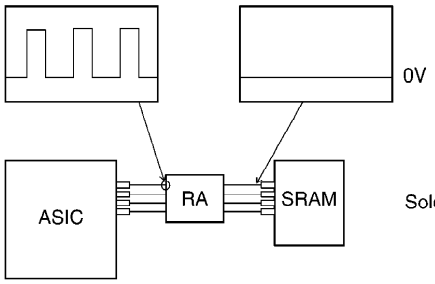
2.



Short between the signal line and GND.



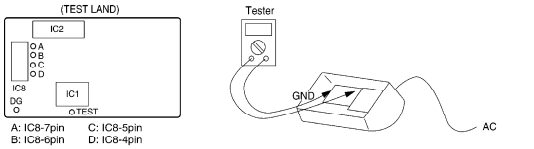
3.



Solder fault on RA.

3.3.6.4. CHECK THE STATUS OF THE DIGITAL BOARD

Put the unit in the test mode and check the voltage at lands A, B, C and D.



A: IC8-7pin C: IC8-5pin
B: IC8-6pin D: IC8-4pin

Turn off the power supply.
Short using a metallic object, such as tweezers, between the TEST and GND land, and turn on the AC power.
Check the following after turning on the power, using an oscilloscope or tester.
To cancel the status check mode, turn off the AC power.

Item	Check point voltage				Check points
	A	B	C	D	
MODEM(IC5)	0V	5V	0V	0V	IC5
S-RAM(IC4)	0V	0V	5V	0V	IC4 (20 pin), IC1 (13 pin), IC4, R19
ASIC(IC1)	0V	0V	0V	0V	RA1–RA8, R5, R7–R8, R11–R13, IC1
ALL OK	5V	5V	0V	0V	

This indicates that the Add/Data Bus. RAM. ROM. MODEM, and ASIC are all completely connected to the CPU and that control from the CPU is possible.

Please check the soldering and conduction of these components.
If there is no problem, replace the ICs.

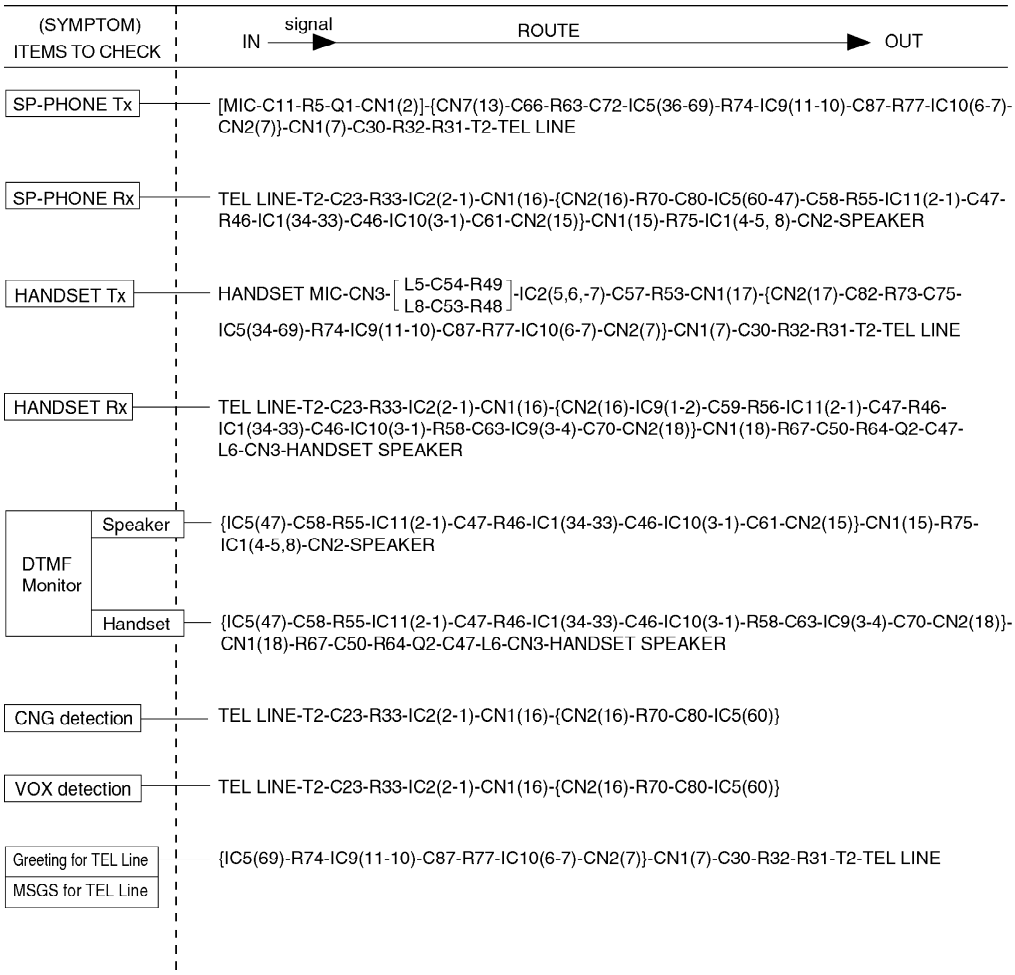
If you still have a problem with the digital board, refer to **NG wave pattern**.

To cancel the status check mode, turn off the AC power.

3.3.7. ANALOG BOARD SECTION

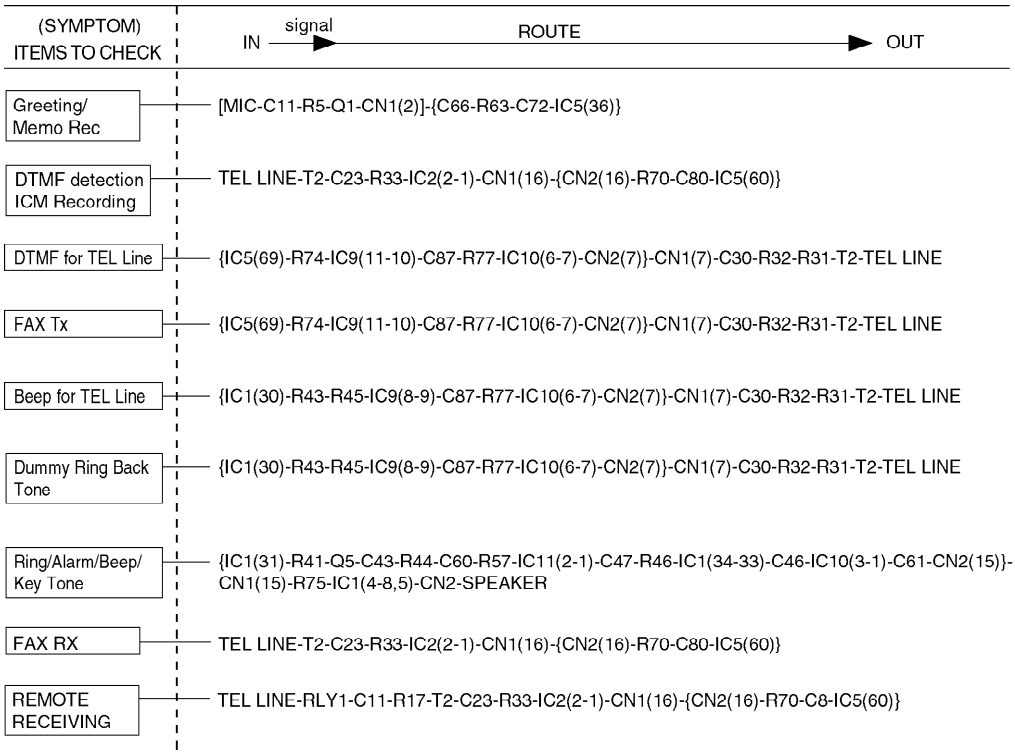
The analog parts check is actually different than the digital parts check. The signal route is determined by the purpose of the check. For example, the handset TX route begins from the handset microphone and is output in the telephone line. In this route, it is mainly an analog signal. Tracing the signal can be done easily using an oscilloscope. Each route is shown on the CHECK SHEET ()here. If there is a problem with the unit (for example, you cannot communicate with the H/S, etc.), trace the signal in the area and determine the cause.

3.3.7.1. CHECK SHEET



Note:

{ }: Inside the digital board / [ ]: Inside the operation board



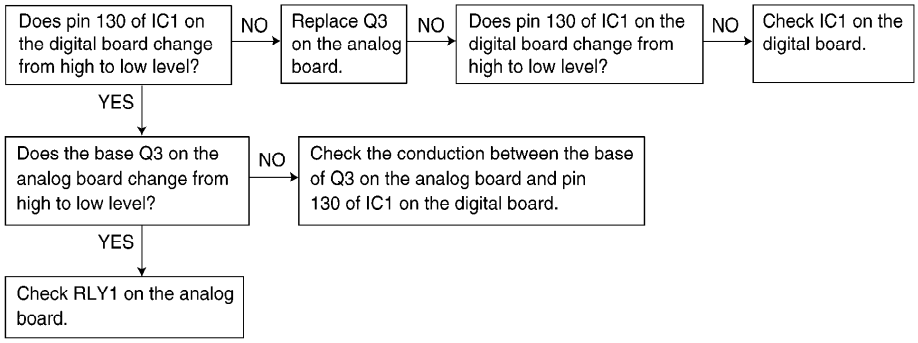
Note:
{ }: Inside the digital board / [ ]: Inside the operation board

3.3.7.2. DEFECTIVE ITS (INTEGRATED TELEPHONE SYSTEM) SECTION

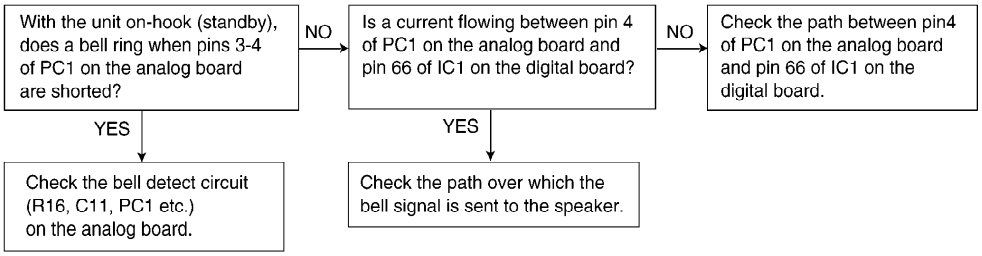
a. No handset and monitor transmission/reception

Following the ITS section or NCU section, search for the route between the microphone and the telephone line (sending) or between the telephone line and the speaker (receiving) where the signal disappears. Check the components at that point.

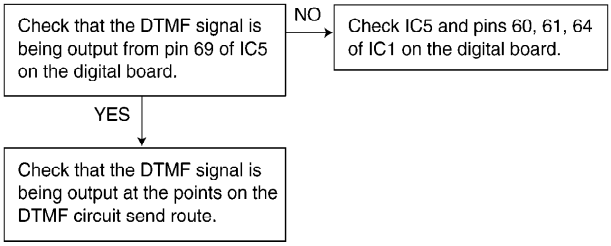
b. No pulse dialling



c. Not ring tone

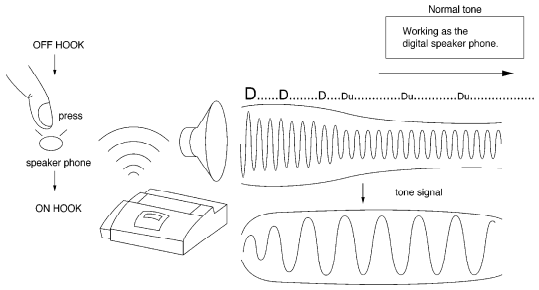


d. No tone dialling



3.3.8. DIGITAL SPEAKERPHONE

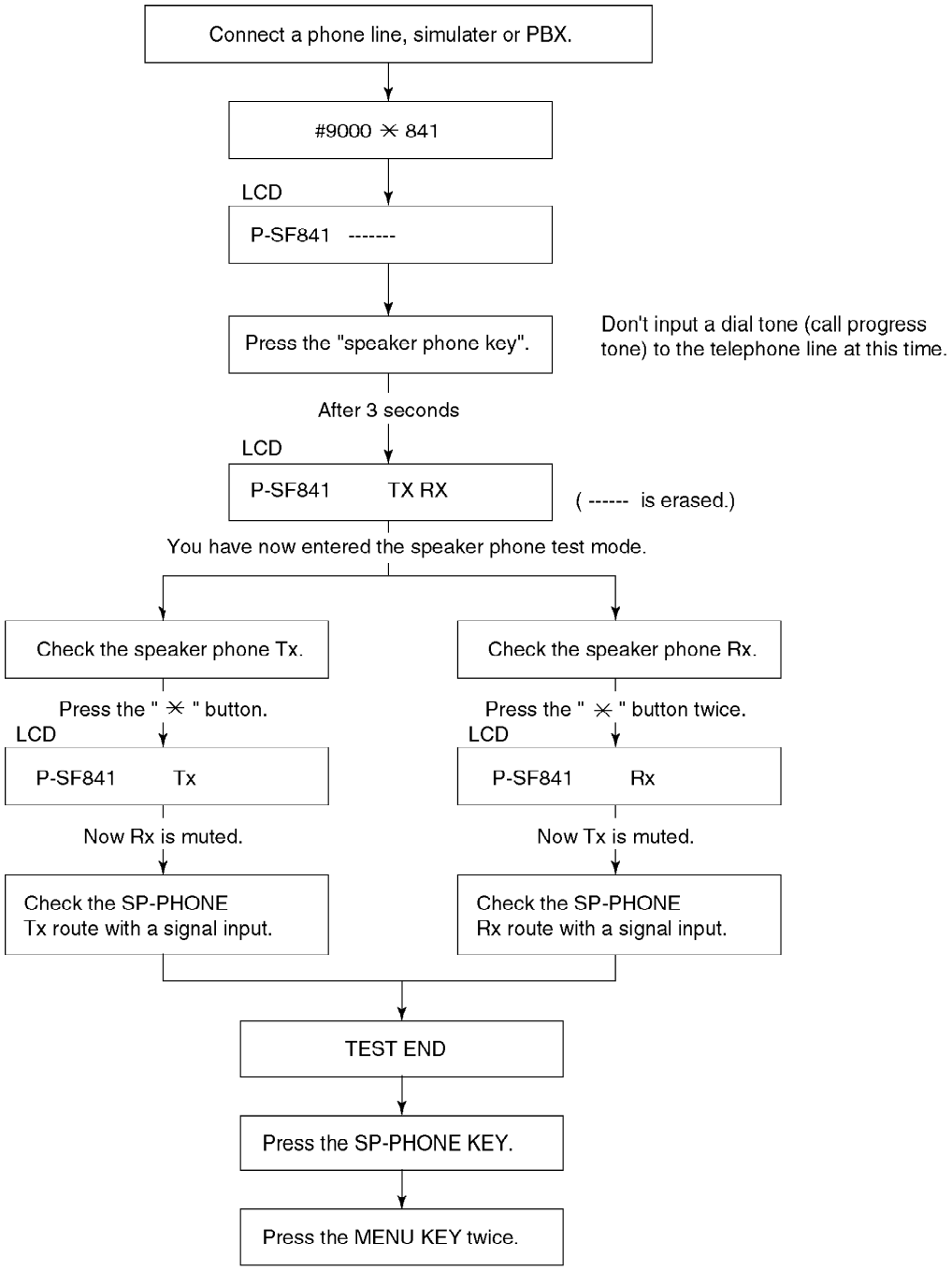
The digital speakerphone has different features from the analog speakerphone.
The analog speakerphone switches between Tx or Rx. Either Tx or Rx is able to pass through a telephone line or speaker, depending on the Tx and Rx signal (voice) level. The higher-level signal (either TX or RX) can pass through the route.
Therefore, you never hear the other party's voice while you are talking. However, the digital speakerphone allows you to hear the other party's voice while you are talking. So both Tx and Rx are active at the same time. There is also a defference in the troubleshooting procedures between the two types.
At the start of communication, during the initial 2~3 correspondences, the digital speakerphone performs half-duplex operation, alternating between transmission (Tx) and reception (Rx). Then duplex communication becomes available.
Learning occurs during the initial 2~3 correspondences in order to set the appropriate parameters for duplex communication.



You cannot check the digital speaker phone by the signal route test mentioned in the Analog Board Section because the level is always changing as stated above.
Therefore, there is a service function for this troubleshooting. In this service mode, you can set the mute to either Tx or Rx. Then you can check the signal route of the speaker phone Tx or the speaker phone Rx without any disturbances.

HOW TO USE THE **841** SERVICE FUNCTION for THE DIGITAL SPEAKER PHONE

Please check by using the service function #9000 ✳ 841.



Refer to ANALOG BOARD SECTION ().

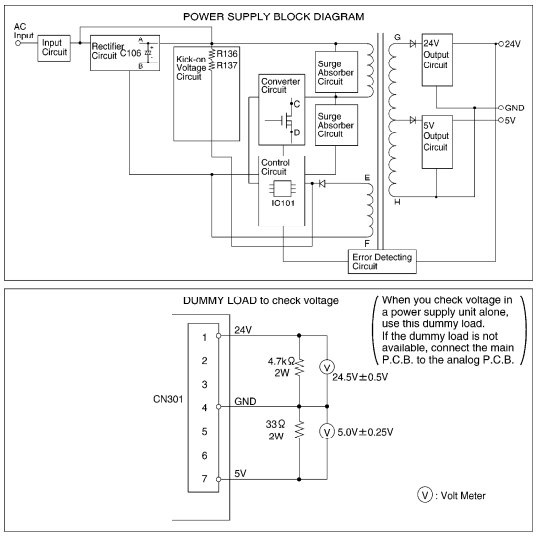
3.3.9. POWER SUPPLY BOARD SECTION

1. Key components for troubleshooting
Check the following parts first: F101, D101-D104, C106, Q101, PC101 and IC101.
This comes from our experience with experimental tests. For example: power supply and lightning surge voltage test, withstanding voltage test, intentional short circuit test, etc.

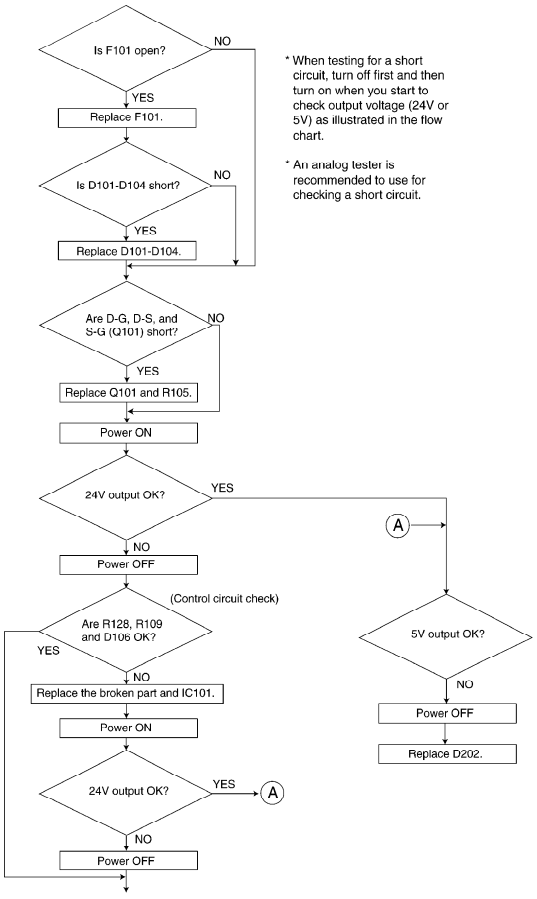
Caution:

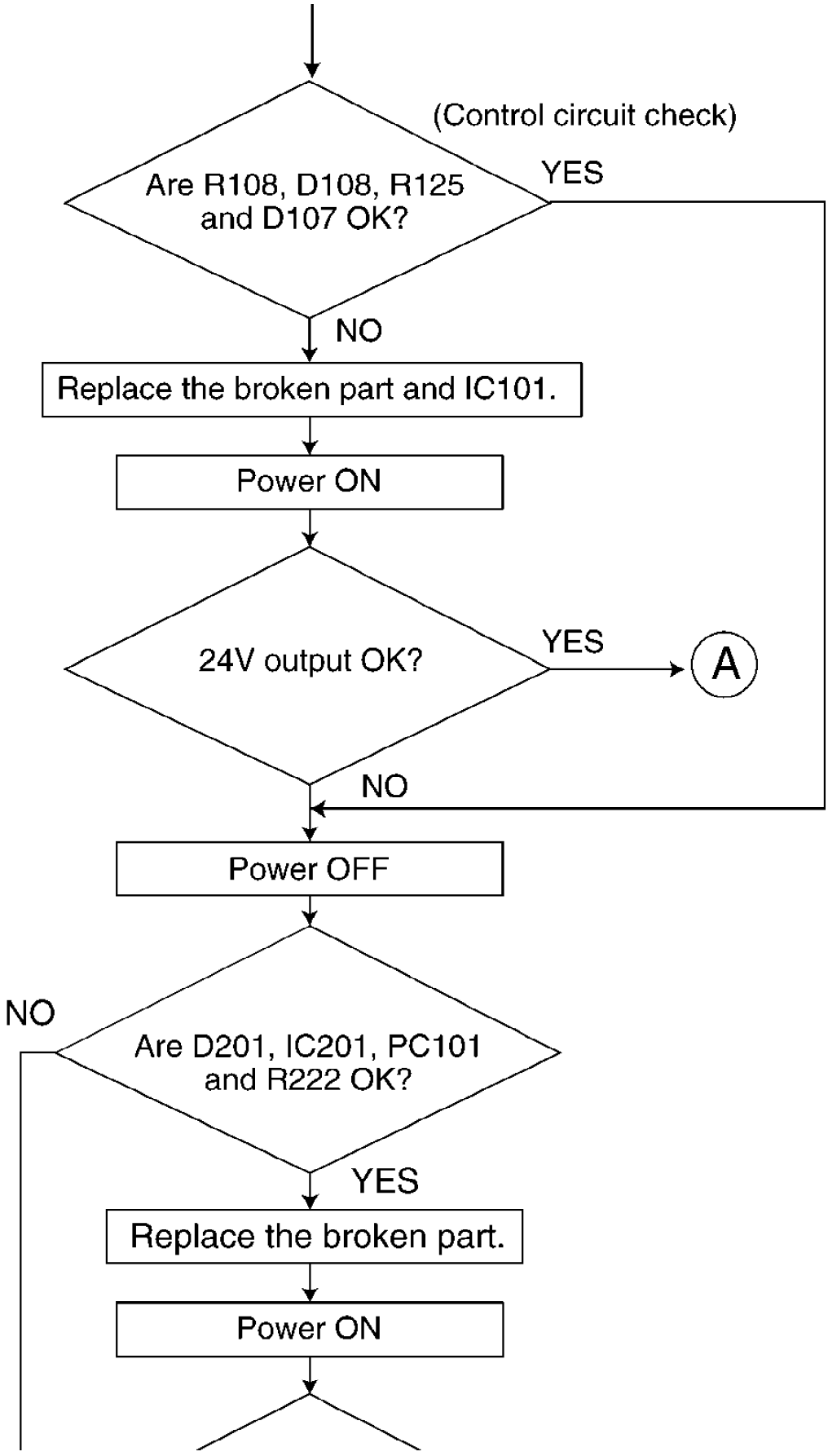
If you find a melted fuse in the unit, do not turn on the power until you locate and repair the faulty parts (except for the fuse); otherwise the fuse will melt again and you cannot pinpoint the faulty point.

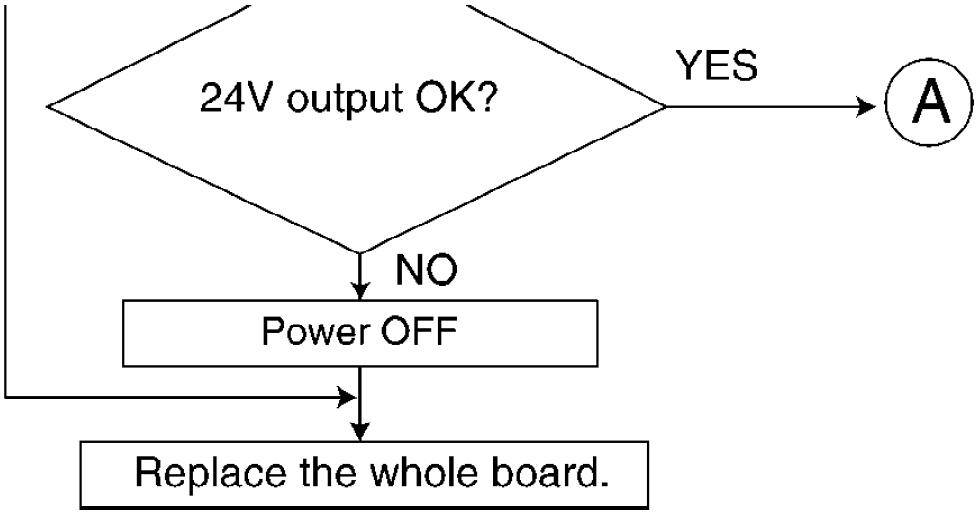
In most cases, the symptom is that nothing is output. It is more likely that the fault is in the primary side rather than the secondary side. Check the primary side first.



2. Troubleshooting Flow Chart


Is F101 open?
NO
YES
Replace F101.
Is D101-D104 short?
NO
YES
Replace D101-D104.
Are D-G, D-S, and S-G (Q101) short?
NO
YES
Replace Q101 and R105.
Power ON
24V output OK?
YES
NO
Power OFF
(Control circuit check)
Are R128, R109 and D106 OK?
YES
NO
Replace the broken part and IC101.
Power ON
24V output OK?
YES
A
NO
Power OFF
A
5V output OK?
NO
Power OFF
Replace D202.
* When testing for a short circuit, turn off first and then turn on when you start to check output voltage (24V or 5V) as illustrated in the flow chart.
* An analog tester is recommended to use for checking a short circuit.

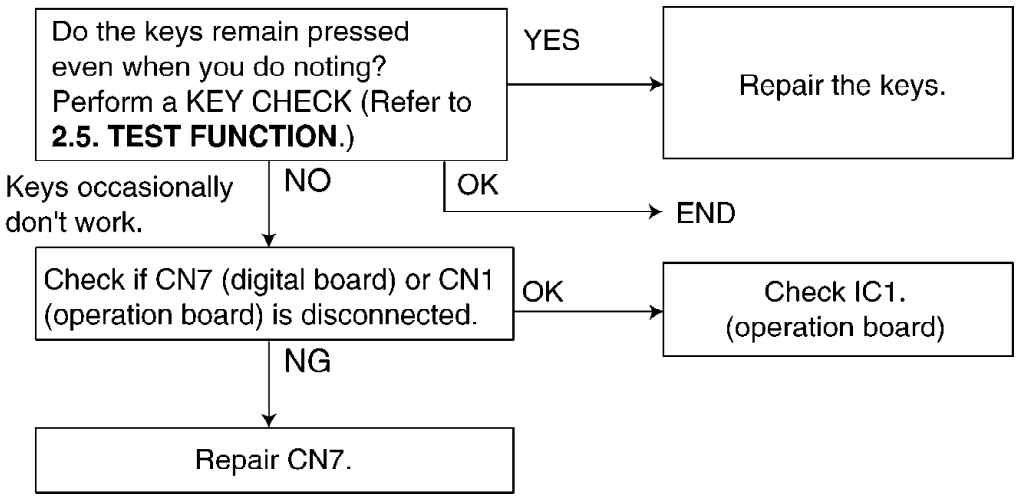

(Control circuit check)
Are R108, D108, R125 and D107 OK?
YES
NO
Replace the broken part and IC101.
Power ON
24V output OK?
YES
A
NO
Power OFF
NO
Are D201, IC201, PC101 and R222 OK?
YES
Replace the broken part.
Power ON



3. Broken parts repair details
(D101, D102, D103, D104)
Check for a short-circuit in terminal 4. If D101, D102, D103 and D104 are short-circuits, F101 will melt (open).
In this case, replace all of the parts (D101, D102, D103, D104, F101).
(Q101)
The worst case of Q101 is a short-circuit between the Drain and Gate because damage expands to the peripheral circuit of Q101.
This is due to a very high voltage through the Gate circuit which is composed of R128, R109, D106 and IC101.
You should change all of the parts listed as follows.
F101, Q101, R128, R109, D106, IC101
(D201)
If D201 is broken, the oscillation circuit in the power supply cannot operate. Check it with an electric tester.

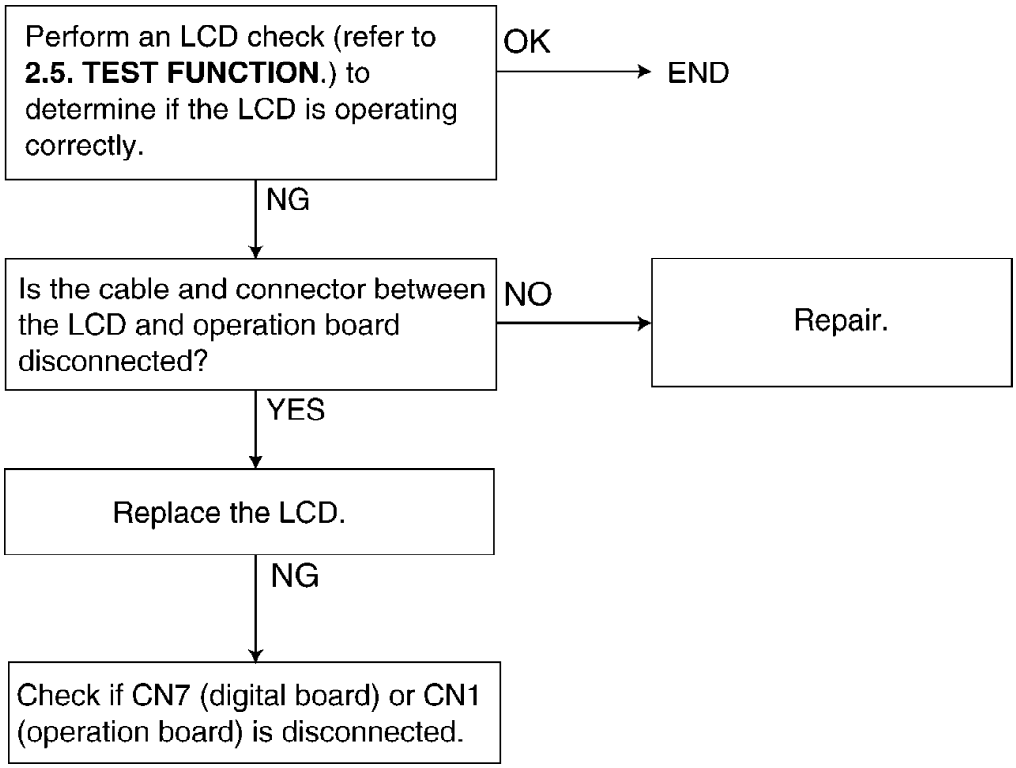
3.3.10. OPERATION BOARD SECTION

3.3.10.1. NO KEY OPERATION



CROSS REFERENCE:
TEST FUNCTIONS ()

3.3.10.2. NO LCD INDICATION

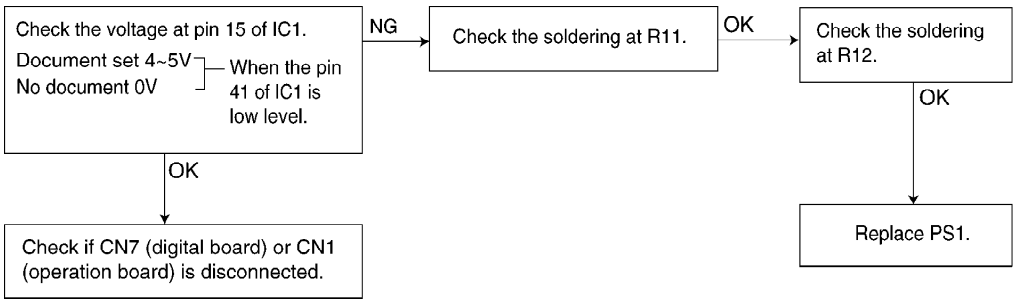


CROSS REFERENCE:
TEST FUNCTIONS ()

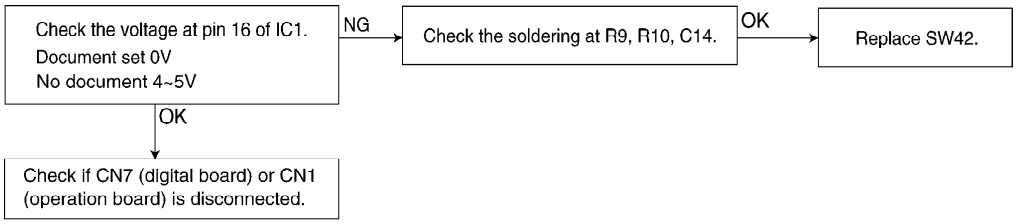
3.3.11. SENSOR SECTION

Refer to 6.5. SENSORS AND SWITCHES for the circuit descriptions.

3.3.11.1. CHECK THE DOCUMENT SENSOR (PS1)....."CHECK DOCUMENT" / (REVISAR DOC)

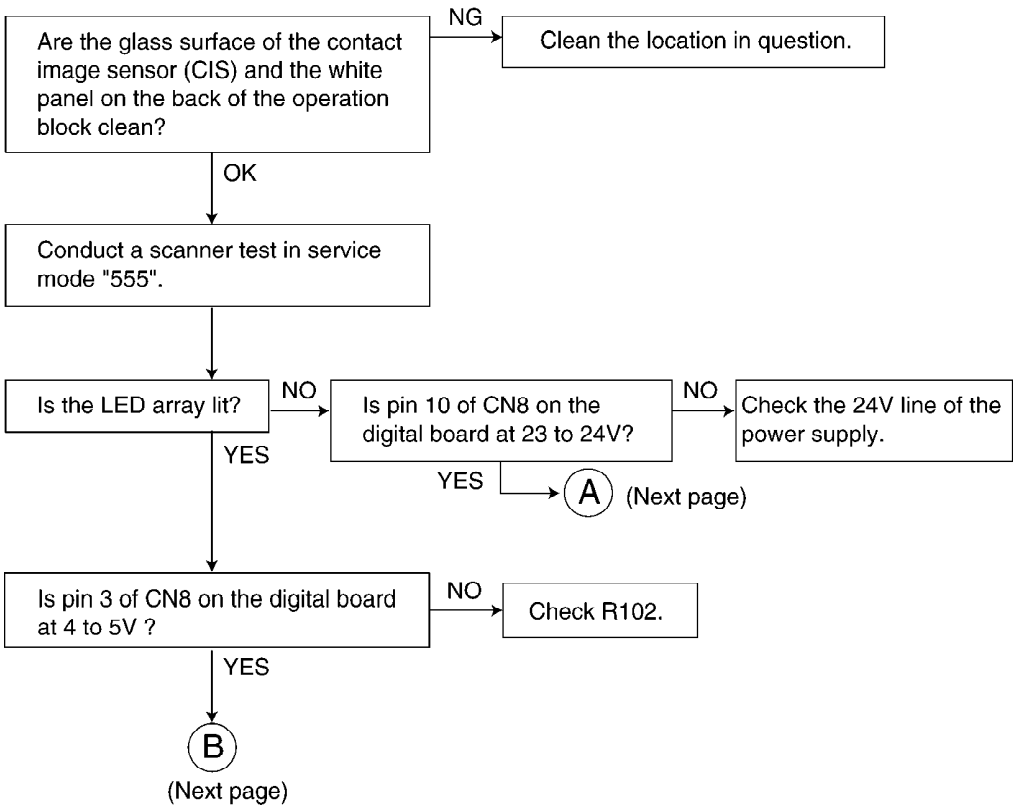


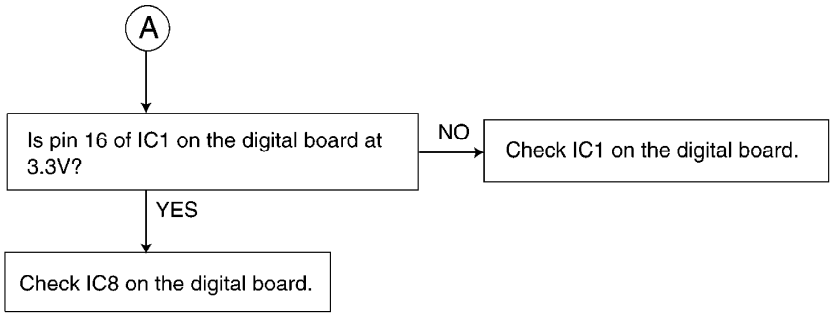
3.3.11.2. CHECK THE READ POSITION (SW42)....."REMOVE DOCUMENT" / (REVISAR DOC)

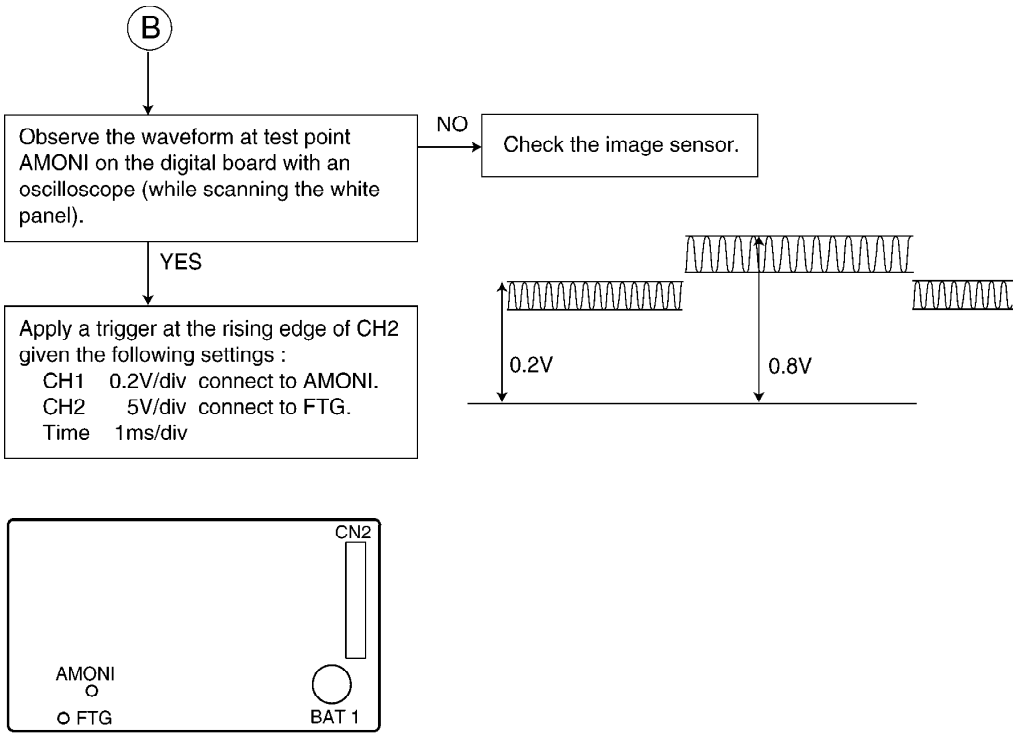


3.3.12. READ SECTION

Refer to SCANNING BLOCK ().

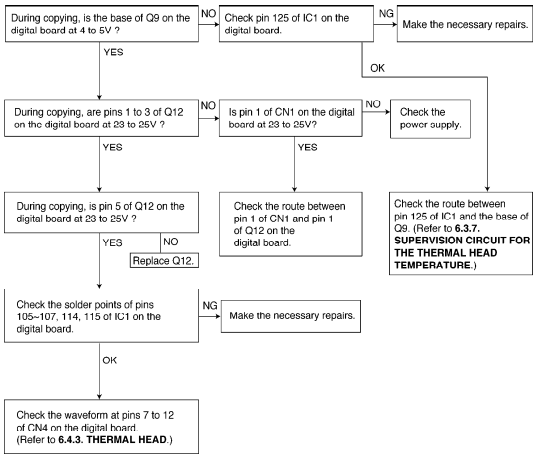






3.3.13. THERMAL HEAD SECTION

Refer to THERMAL HEAD ().



CROSS REFERENCE:
SUPERVISION CIRCUIT FOR THE THERMAL HEAD TEMPERATURE ()
THERMAL HEAD ()

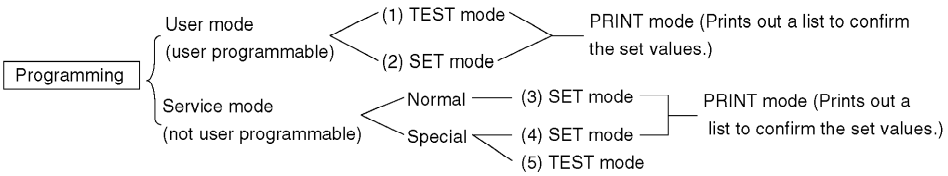
3.4. PROGRAMMING AND LISTS

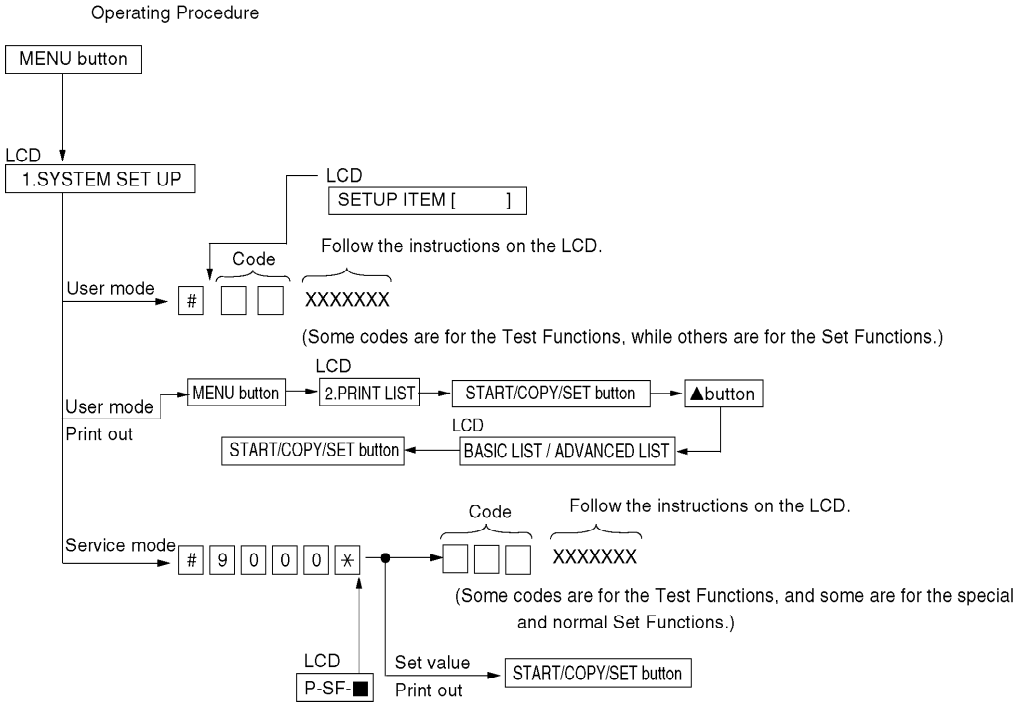
The programming functions are used to program the various features and functions of the machine, and to test the machine. / Programming can be done in both the on-hook and off-hook conditions. This facilitates communication between the user and the service while programming the machine.

3.4.1. OPERATION

There are 2 basic categories of programming functions, the User Mode and the Service Mode. The Service Mode is further broken down into the normal and special programs. The normal programs are those listed in the Operating Instructions and are available to the user. The special programs are only those listed here and not displayed to the user. In both the User and Service Modes, there are Set Functions and Test Functions. The Set Functions are used to program various features and functions, and the Test Functions are used to test the various functions. / The Set Functions are accessed by entering their code, changing the appropriate value, then pressing the SET key. / The Test Functions are accessed by entering their code and pressing the key listed on the menu. While programming, to cancel any entry, press the STOP key.

3.4.2. OPERATION FLOW





CROSS REFERENCE:
TRANSLATION LIST (ENGLISH,PORTUGUESE) ()

3.4.3. USER MODE (The list below is an example of the SYSTEM SETUP LIST the unit prints out.)

[FUNÇÕES BÁSICAS]

NO.	FUNÇÃO	PROGRAMAÇÃO VIGENTE	
#01	HORA E DATA	01 JAN. 2000 00:00	
#02	SEU LOGOTIPO		
#03	SEU NÚMERO DE FAX		
#04	IMPRESSÃO DE RELATÓRIO	ERRO	[ERRO,LIGADO,DESL.]
#05	RECEPÇÃO AUTOMÁTICA	SEC/FAX	[SEC/FAX,FAX,TEL/FAX]
#06	CONTADOR DE TOQUES SEC/FAX	1	[1...4,POUPA LIG.,RING DESL.]
#07	CONTADOR DE TOQUES FAX	1	[1...4]
#09	ATRAZO DE RING TEL/FAX	1	[1...4]
#10	TEMPO DE GRAVAÇÃO	VOZ	[VOZ,1 MIN]
#11	CÓDIGO DE ACESSO À DISTÂNCIA		
	CÓDIGO =	111	
#13	TIPO / DISCAGEM	TOM	[TOM,PULSO]

Code ↗ ↖ Set Value

[FUNÇÕES AVANÇADAS]

NO.	FUNÇÃO	PROGRAMAÇÃO VIGENTE	
#22	IMPRESSÃO DE RELATÓRIO	LIGADO	[LIGADO,DESL.]
#23	TRANSMISSÃO LONGA DISTÂNCIA	DESL.	[LIGADO,DESL.]
#25	TRANSMISSÃO PROGRAMADA	DESL.	[LIGADO,DESL.]
	TEL =		
	INÍCIO =	00:00	
#30	RECEPÇÃO SILENCIOSA	3	[3...9]
#31	DETECÇÃO DE TIPO DE RING	DESL.	[A,B,C,D,DESL.]
#39	CONTRASTE DO DISPLAY	NORMAL	[NORMAL,ESCURO]
#41	CÓDIGO DE ATIVAÇÃO À DISTÂNCIA	LIGADO	[LIGADO,DESL.]
	CÓDIGO =	*9	
#42	ALERTA DE MENSAGEM	DESL.	[LIGADO,DESL.]
#43	ALERTA DE TEMPO DE GRAVAÇÃO	DESL.	[LIGADO,DESL.]
#46	RECEPÇÃO FACILITADA	LIGADO	[LIGADO,DESL.]
#47	GUIA DE VOZ	LIGADO	[LIGADO,DESL.]

NOTA : QUANDO ESTA FUNCÇÃO FOR DESLIGADA SEM QUE A MENSAGEM DE TRANSFERÊNCIA TENHA SIDO GARAVADA, A MENSAGEM SERÁ DESATIVADA PARA OS SEGUINTES CASOS(#60).

#49	AUTO DESCONEXÃO	LIGADO	[LIGADO,DESL.]
	CÓDIGO =	*0	
#54	TEMPO DA MENSAGEM DE SAUDAÇÃO	16s	[16s,60s]

NOTA : QUANDO SE AJUSTA O TEMPO DE GRAVAÇÃO DA MENSAGEM DE SAUDAÇÃO DE 60S, A MENSAGEM DE SAUDAÇÃO DA SECRETÁRIA ELETRÔNICA SERÁ CANCELADA, E O TEMPO DE GRAVAÇÃO DA MENSAGEM DE SAUDAÇÃO SERÁ LIMITADO EM 16 SEG.

#58	AJUSTE ORIGINAL	NORMAL	[NORMAL,CLARO,ESCURO]
#60	TRANSFERÊNCIA DE MENSAGEM	DESL.	[LIGADO,DESL.]
#61	MENSAGEM DE TRANSFERÊNCIA	OUVIR MENS.	[OUVIR MENS.,GRAVAR MENS.,APAGAR MENS.]
#67	MONITORA RECADO	LIGADO	[LIGADO,DESL.]
#70	AVISO EM PAGER	DESL.	[LIGADO,DESL.]
	TEL =		
#76	TOM DE CONEXÃO	LIGADO	[LIGADO,DESL.]
#80	PROGRAMAÇÃO DE FÁBRICA		

Code ↗ ↖ Set Value

Note:
The above values are the default values.

3.4.4. SERVICE FUNCTION TABLE

Code	Function	Set Value	Effective Range	Default	Remarks
501	Setting the pause time	001~600 X 100 msec	001~600	050	Selects the pause time in 1 msec steps.
502	Setting the flash recall time	01~99 X 10 msec	01~99	70	Selects the line break time flashing in 10 msec steps.
503	Setting the pulse dial speed	1:10pps 2:20pps	1, 2	1	Sets the pulse dial speed.
510	VOX time	1:6 sec 2:4 sec	1, 2	1	Setting of the end of call confirmation time by VOX.
520	Setting the CED frequency	1:2100Hz 2: 1100Hz	1, 2	1	When international communications cannot b performed smoothly selec 1100Hz. However some ex system should not be acc (1100Hz on CED). (See "5. copy, but cannot transmit/ long distance or internatio communications" in DEFE FACSIMILE SECTION ().)
521	Setting the international line mode	1:ON 2:OFF	1, 2	1	Selects the international li during FAX communicatio "5. Unit can copy, but can transmit/receive long dista international communicati DEFECTIVE FACSIMILE SI ().)
522	Setting the return to default mode	1:ON 2:OFF	1, 2	1	Set the resolution and con conditions for FAX or copy default settings.
523	Receive equalizer select	1:0km 2:1.8km 3: 3.6km 4:7.2km	1~4	1	When the telephone statio from the unit or reception be performed correctly, ad accordingly.
524	Transmissionequalizer select	1:0km 2:1.8km 3: 3.6km 4:7.2km	1~4	1	When the telephone statio from the unit or reception be performed correctly, ad accordingly.
533	Setting the number of time that message transfer is redialed	00~99	00~99	03 times	Selects the number of time message transfer is redial including the first dialing).
534	Setting the message transfer/ paper call redial interval	001~999 sec	001~999	030 sec	Sets the interval of messa transfer/pager call redial.

Code	Function	Set Value	Effective Range	Default	Remarks
544	Selecting the document feed position	01~99 step	00~99	---	When the ADF function is incorrect, adjust the feed p (8 step = 1mm)
550	Memory clear				Press "START/COPY/SET"
551	ROM version and sum check				Press "START/COPY/SET"
552	DTMF signal tone test	1:ON 2:OFF	1, 2	2	Press "START/COPY/SET"
553	Setting the FAX monitor function	1: OFF 2:PHASE B 3:ALL	1, 2, 3	1	Sets whether to monitor th signal with the unit's spea during FAX communicatio
554	Modem test				Press "START/COPY/SET"
555	Scanner test				Press "START/COPY/SET"
556	Motor test				Press "START/COPY/SET"
557	LED test				Press "START/COPY/SET"
558	LCD test				Press "START/COPY/SET"
559	Setting the document jam detection	1:ON 2:OFF	1, 2	1	Selects the jam detection document during FAX transmission/copying.
560	Cutter selection	1:ON 2:OFF	1, 2	1	Turns OFF the cutter funct
561	KEY test				Press any key.
562	Cutter test				Press "START" key. [Refer function]
570	Setting the % break	1:61% 2:67%	1, 2	1	Sets the % break of pulse
571	Setting the number of times that ITS is redialed	00~99	00~99	14 times	Selects the number of time ITS is redialed (not includi first dial).
572	Setting the ITS redial interval	001~999 sec	001~999	030 sec	Sets the interval of ITS red
573	Setting of number of rings for REMOTE TURN ON	01~99	01~99	15 times	Sets the number of rings b the unit starts to receive a document in the TEL mod
580	TAM continuous tone detection	1:ON 2:OFF	1, 2	1	ON: Stops TAM operation Dial tone, etc. are detected
590	Setting the number of FAX redial times	00~99	00~99	05 times	Selects the number of redi during FAX communicatio including the first dial).
591	Setting the FAX redial interval	001~999 sec	001~999	045 sec	Sets the FAX redial interva FAX communication.
592	Designation of CNG sending	1: OFF 2:ALL 3: AUTO	1, 2, 3	2	Lets you select the CNG o during FAX transmission. CNG is output at phase A. CNG is output only when automatic dialing is perfor OFF: CNG is not output at

Code	Function	Set Value	Effective Range	Default	Remarks
593	Setting the interval between CED and the 300 bps signal	1: 75 msec 2:500 msec 3:1000 msec	1, 2, 3	1	Sets the interval between t signal and subsequent 30(signal. (See "5. Unit can c(cannot transmit/receive lo distance or international communications" in DEFE FACSIMILE SECTION ().)
594	Setting the overseas DIS detection	1: Detects on the 1st time.2: Detects on the 2nd time.	1, 2	1	Sets the recognition forma DIS signal. 1:Detects the fi signal sent from the receiv during FAX transmission. Ignores the first DIS signa from the receiver during F transmission. (See "5. Uni copy, but cannot transmit/ long distance or internatio communications" in DEFE FACSIMILE SECTION ().)
595	Setting an acceptable reception error value	001~999 X number of times	001~999	100	Sets the number of accept error lines when the FAX reconstructs the received
596	Setting the transmit level	- 15~00	- 15~00	- 10 dBm	Selects the FAX transmiss level.
598	Receiving Sensitivity	- 43dBm	20~48	40	(See "5. Unit can copy, but transmit/receive long dista international communicati DEFECTIVE FACSIMILE SI ().)
717	Transmit speed select	1:9600BPS 2: 7200BPS 3: 4800BPS 4: 2400BPS	1~4	1	Adjusts the speed to start during FAX transmission.
718	Receive speed select	1:9600BPS 2: 7200BPS 3: 4800BPS 4: 2400BPS	1~4	1	Adjusts the speed to start during FAX reception.
719	Ringer off in TEL/ FAX mode	1:ON 2:OFF	1, 2	1	Sets the ringer switch off v call is received in the TEL/ mode.
721	Pause tone detect	1:ON 2:OFF	1, 2	1	Selects the tone detection pauses in dialing.
722	Redial tone detect	1:ON 2:OFF	1, 2	1	Selects the tone detection after redialing.
731	CPC mode	1:A 2:B 3:OFF	1, 2, 3	1	Set the CPC signal detecti mode from the converter.

Code	Function	Set Value	Effective Range	Default	Remarks
763	CNG detect time	1:10 sec 2:20 sec 3:30 sec	1, 2, 3	2	Selects the CNG detection friendly reception.
771	T1 timer	1:35 sec 2:60 sec	1, 2	1	Sets a higher value when t response from the other p needs more time during F/ transmission.
774	T4 timer	00~99	00~99	00	
775	Monitoring of message transfer	1:ON 2:OFF	1, 2	2	If set to ON a message car monitored from this unit's PHONE when transferring message.
784	Voice prompt test				You can hear the voice pro from speaker after pressin "START" key.
815	Sensor check				Press "START/COPY/SET"
841	Digital SP-Phone check				See DIGITAL SPEAKERPH
882	Journal 3 list				See PRINTOUT EXAMPLE

3.4.5. SERVICE MODE SETTINGS (Example of a printed out list)

```
[ SERVICE DATA LIST ]

501 PAUSE TIME              =  050*100ms        [001...600]*100ms
502 FLASH TIME              =  70*10ms          [01...99]*10ms
503 DIAL SPEED              =  10pps            [1=10     2=20]pps
510 VOX TIME                =  6sec             [1=6      2=4]sec
520 CED FREQ.               =  2100Hz           [1=2100   2=1100]Hz
521 INTL. MODE              =  ON               [1=ON     2=OFF]
522 AUTO STANDBY            =  ON               [1=ON     2=OFF]
523 RCV EQL.                =  0.0Km            [1=0.0    2=1.8   3=3.6   4=7.2]Km
524 SND EQL.                =  0.0Km            [1=0.0    2=1.8   3=3.6   4=7.2]Km
  Code                        Set Value

[ SPECIAL SERVICE SETTINGS ]
                    Code
533   534   544   552   553   559   560   570   571   572   573   580   590
 03   030    50     2     1     1     1     1    14   030    15     1    05
                Set Value
591   592   593   594   595   596   598   717   718   719   721   722   731
045     2     1     1   100    10    40     1     1     1     1     1     1

763   771   774   775
  2     1    00     2
```

Note:
The above values are the default values.

```
[ HISTORY ]

1. DATE

   TIME=00002 HOURS
2. KEY OPERATION
   1ST. 50:
   01 04 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
   00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
   LAST 50:
   00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
   00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
3. NUMBER OF COPY
   =00000
4. NUMBER OF RX
   =00000
5. NUMBER OF TX
   =00000

YOUR LOGO
YOUR FAX NUMBER
```

3.4.6. OTHER

[HISTORY]

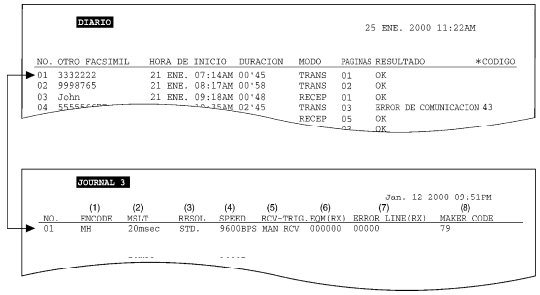
No.	Display	Function
1	DATE	Date and time which are set by a user for the first time after purchase. TIME is the expiration from the first power on after purchase.
2	KEY OPERATION	Indicate 2-digit codes. (Refer to **2.5.2. BUTTON CODE TABLE**). 1st.50: History of the key operation from 1st to 50th after purchase. Last.50: History of the last 50 key operations.
3	NUMBER of COPY	The number of pages copied.
4	NUMBER of RX	The number of pages received.
5	NUMBER of TX	The number of pages sent.

CROSS REFERENCE:
BUTTON CODE TABLE ()

3.4.7. SPECIAL SERVICE JOURNAL REPORTS

Example:

Journal 3 shown below, which are special journals giving the additional detailed information about the latest 35 communications, can be printed by Service Code 882. Remote printing function for the journal reports (JOURNAL and JOURNAL 3) is also available for service technicians. (Refer to REMOTE PROGRAMMING ().) The JOURNAL report only gives you basic information about a communication, but the JOURNAL 3 report provide different information on the same item (communication).



HOW TO READ JOURNAL REPORTS:

1. **Look at NO. 01 in the JOURNAL. If you want to know about the details about that item, see NO. 01 in the JOURNAL 3. You can get the following information.**
   *** MODE: Fax transmission / * TX SPEED: 9.6 kbps / * RESOLUTION : standard / * ENCODE: MH / * MAKER CODE: 79**

For further details, see JOURNAL 3 ().

3.4.7.1. JOURNAL 3

Descriptions:

1. **ENCODE**
   Compression Code: MH/MR
2. **MSLT**
   MSLT means Minimum Scan Line Time. Used only at the factory.
3. **RESOLUTION (RESOL)**
   Indicates the resolution of the communication. If multiple pages are transmitted or received, it indicates the last page's resolution. If there is a communication error, “?” is displayed.
4. **SPEED**
   Indicates the speed of communication. If multiple pages are transmitted or received, it indicates the last page´s communication speed. If there is a communication error, “?” is displayed.

5. RCV-TRIG. (CNT.)

Indicates the trigger that causes the unit to switch to the fax receive mode. The available options are listed in JOURNAL 3 in 2.4.7.2. PRINTOUT EXAMPLE. The values in parentheses indicate how many times the trigger has been used. (For example, “0003” means three times.)

No.	Display	Function
1	FAX MODE	Means the unit received a fax message in the FAX mode.
2	MAN RCV	Means the unit received a fax message by manual operation.
3	FRN RCV	Means the unit received a fax message by friendly signal detection.
4	RMT DTMF	Means the unit detected DTMF (Remote Fax activation code) entered remotely.
5	PAL DTMF	Means the unit detected DTMF (Remote Fax activation code) entered by a paralle connected telephone.
6	TURN-ON	Means the unit started to receive after 15 rings. (Remote Turn On: Service Code #573)
7	TIME OUT	Means the unit started to receive after Ring Time Out in the EXT-TAM or TEL/FA mode.
8	IDENT	Means the unit detected Ring Detection.
9	TEL/FAX	Means the unit detected the CNN while it was sending the Dummy Ring Back To in the TEL/FAX mode.

[NO RESPONSE DISAPPEARED ON JOURNAL]

The “NO RESPONSE DISAPPEARED ON JOURNAL” displays the information about the last 10 communications terminated by “No Response”. (Some of the communications terminated by “No Response” were not displayed in the JOURNAL.)When a fax transmission cannot be performed because the other party's unit is set to the TEL mode, “No response” will be printed.

6. EQM

EQM means Eye Quality Monitor. Used only at the factory.

7. ERROR LINE(RX)

When an error occurs while receiving a fax, this shows the number of error lines.

8. MAKER CODE

This shows a 2 digit code of the other partyís fax machine brand. 0E: “KX” model / 00: Unknown / 79: “UF” model / 19: “Xerox” model

[JOURNAL3]

01 ENE. 1999 12:04AM

NO.	ENCODE	MSLT	RESOL	SPEED	RCV-TRIG.	EOM(RX)	ERROR LINE(RX)	MAKER CODE
01	MR	20msec	STD.	9600BPS	?	000000	00000	0E

3.5. TEST FUNCTIONS

Test mode	Type of Mode	Code □□ Operation after code input.	Function
PRINT TEST	User mode	[8] [5] START	Prints a test pattern and checks the thermal head for abnormalities (missing dots, etc.), and also checks the operation of the reception motor. (Refer to **2.5.3. PRINT TEST PATTERN.**)
MOTOR TEST	Service Mode	[5] [5] [6] START	Rotates the transmission and reception motors to check the operation of the motors. 0.....Stop 1.....Set the can gear to TRANSMIT mode 2.....Set the can gear to CUTTER mode 3.....Set the can gear to REVERSE mode 4.....Set the can gear to RECEIVE mode 5.....Set the can gear to COPY mode 6.....Turn forward roller at 432pps 2-2phase 7.....Turn forward roller at 432pps 1-2phase 8.....Turn forward roller at 216pps 2-2phase 9.....Turn forward roller at 216pps 1-2phase Press the STOP button to cancel.
MODEM TEST	Service Mode	[5] [5] [4] START	Sends four kinds of FAX signals to check the sending function of the modem. 1) 1100 Hz: Consecutive signal of EOM for tonal 2) 2100 Hz: G2 carrier signal Consecutive of CED signal 3) G3, V29 training signal [modulation wave of carrier signal (1700 Hz)]
ROM CHECK	Service Mode	[5] [5] [1] START	Indicates the version and checks the sum of the ROM.
SCAN CHECK	Service Mode	[5] [5] [5] START	Turns on the LEDs of the image sensor and operates the read systems.
LCD CHECK	Service Mode	[5] [5] [8] START	Checks the LCD indication. Illuminates all the dots to check if they are normal.
DTMF SINGLE TEST	Service Mode	[5] [5] [2] 1..On 2..Off	Outputs the DTMF with a single tone.
KEY CHECK	Service Mode	[5] [6] [1] START { any key	Checks the operation button. Indicates the button code on the LCD while the button is pressed. Refer to **2.5.2. BUTTON CODE TABLE**.
FACTORY SET	Service Mode	[5] [5] [0] START	Clears the memory where the users can store data.
SENSOR CHECK	Service Mode	[8] [1] [5] START	CHECKS THE SENSOR OPERATION After entering this mode, perform the copy operation. [Do Sn Ja Pa] : LCD DISPLAY Do : Document Sensor : Paper inserted. Turns on when a document is inserted. Sn : Read Position Sensor : At the read Position. Turns on when the front cover is opened and the sensor lever is pressed directly. Ja : Jam Sensor: : Turns on when the front cover is opened and the sensor Pa : Recording Paper Sensor : Set Recording Paper. Turns on and off when the cassette lock lever is pushed down and up.

CROSS REFERENCE:

BUTTON CODE TABLE ()
PRINT TEST PATTERN ()

Test mode	Type of Mode	Code □□□ Operation after code input.	Function
LED CHECK	Service Mode	5 5 7 START	Turn on the message LED.
DIGITAL SPEAKERPHONE RX & TX CHECK	Service Mode	8 4 1 SPEAKERPHONE	Please refer to **2.3.8. DIGITAL SPEAKERPHONE**.

CROSS REFERENCE:
DIGITAL SPEAKERPHONE ()

3.5.1. DTMF SIGNAL TONE TRANSMIT SELECTION

When set to ON (=1), the 12 keys and transmission frequencies are as shown.

key	High Frequency (Hz)	Key	Low Frequency (Hz)
"1"	697	"5"	1209
"2"	770	"6"	1336
"3"	852	"7"	1477
"4"	941	"8"	1633

When set to OFF (=2), the 12 keys and transmission frequencies are as shown.

High (Hz) / Low (Hz)	1209	1336	1477
697	"1"	"2"	"3"
770	"4"	"5"	"6"
852	"7"	"8"	"9"
941	*	"0"	"#"

Note:

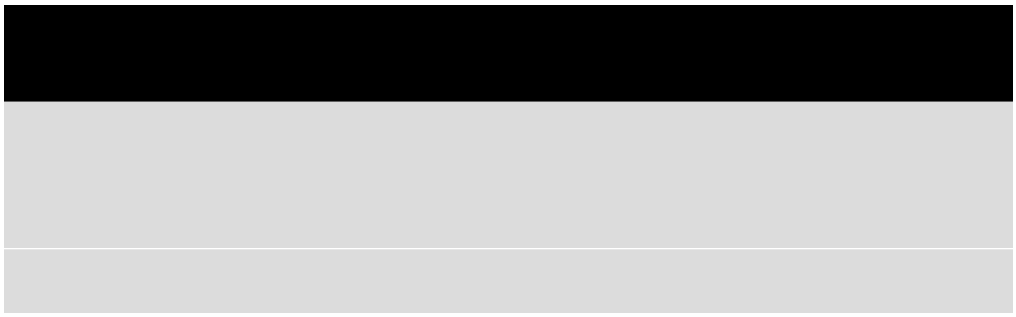
After performing this check, do not forget to turn the setting off. Otherwise, dialing using DTMF will not be possible.

3.5.2. BUTTON CODE TABLE

Code	Button Name	Code	Button Name	Code	Button Name
02	RESOLUTION	14	RECORD	37	7
03	RECEIVE MODE	16	ERASE	38	8
04	START/COPY/SET	18	PLAY MESSAGE	39	9
05	MENU	20	JOG ↘	3A	0
07	HELP	21	JOG ↙	3B	*
08	SP-PHONE	31	1	3C	#
0A	MUTE	32	2	3D	REDIAL/PAUSE
0C	DIRECTORY	33	3	3E	FLASH
0D	∧ VOLUME	34	4	00	NO INPUT
0E	∨ VOLUME	35	5	01	STOP
0F	BROAD CAST	36	6		

Note:
These codes (00, 01) are only for the data in the History Report.

3.5.3. PRINT TEST PATTERN

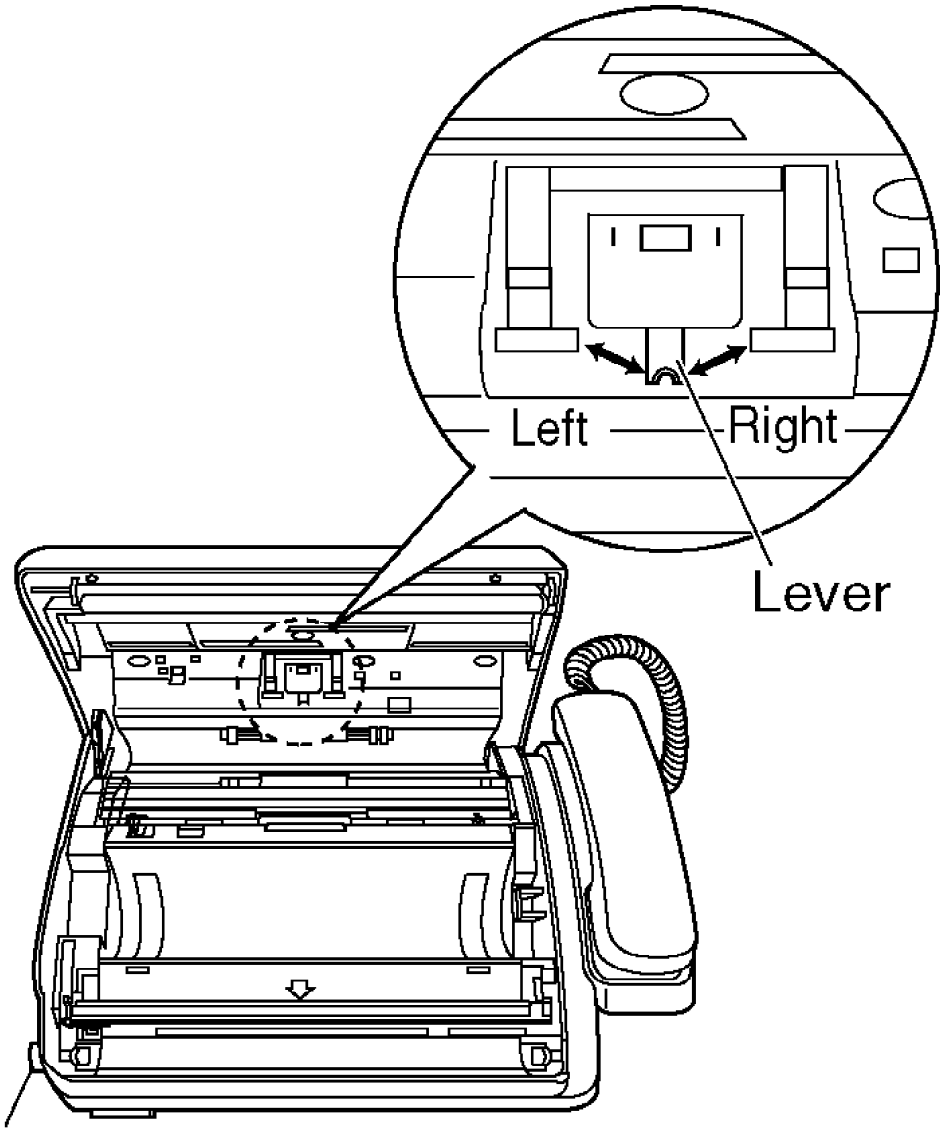


4. ADJUSTMENTS

4.1. ADJUSTING THE FEED PRESSURE

If no feeding or multiple feeding occurs frequently, adjust the feeder pressure.

1. **Open the front lid by pressing the front lid open.**
2. **Shift the position of the lever using an instrument with a pointed end, such as paper clip.**
   Right: When documents do not feed.
   Center: Standard position (pre-selected)
   Left: When documents multiple feed.
3. **Close the front lid by gently pressing down on both ends.**



Note:

Touch the lever using an instrument with a pointed end such as ball -point pen because the lever is located in a small place.

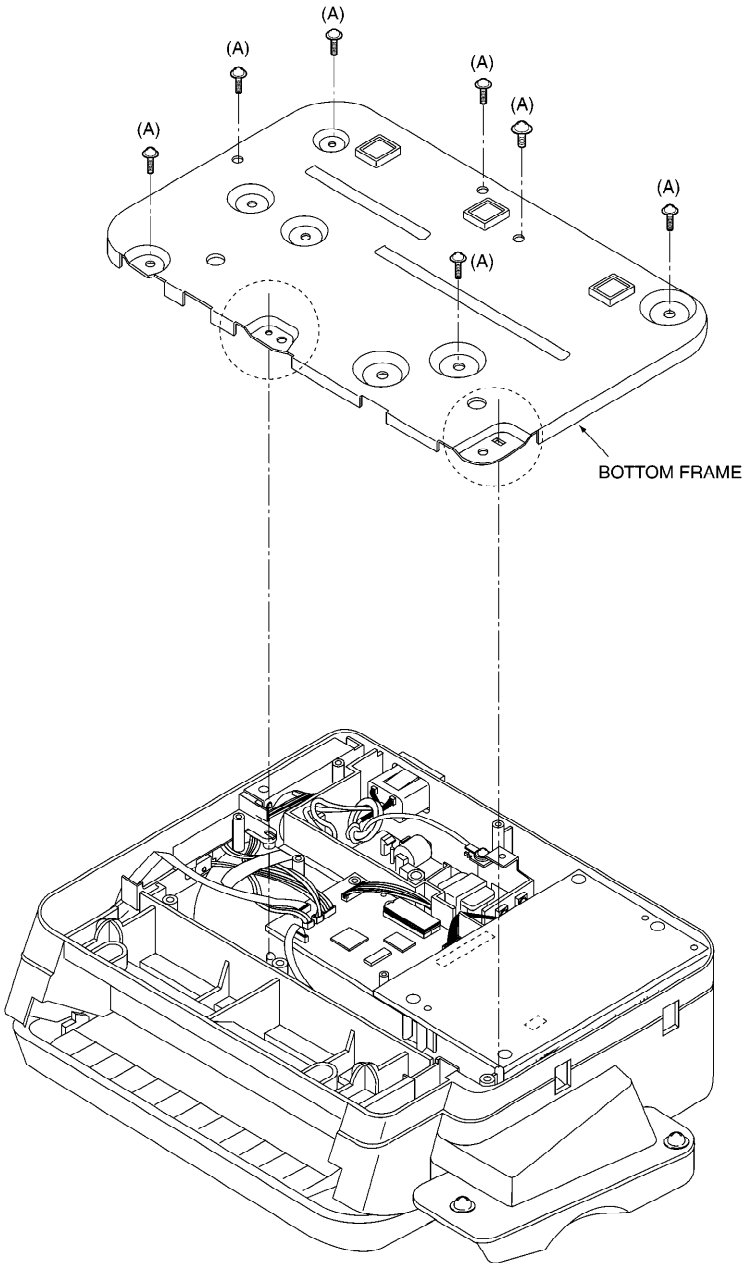
5. DISASSEMBLY INSTRUCTIONS

5.1. HOW TO REMOVE THE BOTTOM FRAME

Procedure 1

Ref. No. 1

1) Remove the 7 screws (A).
2) Remove the Bottom frame.

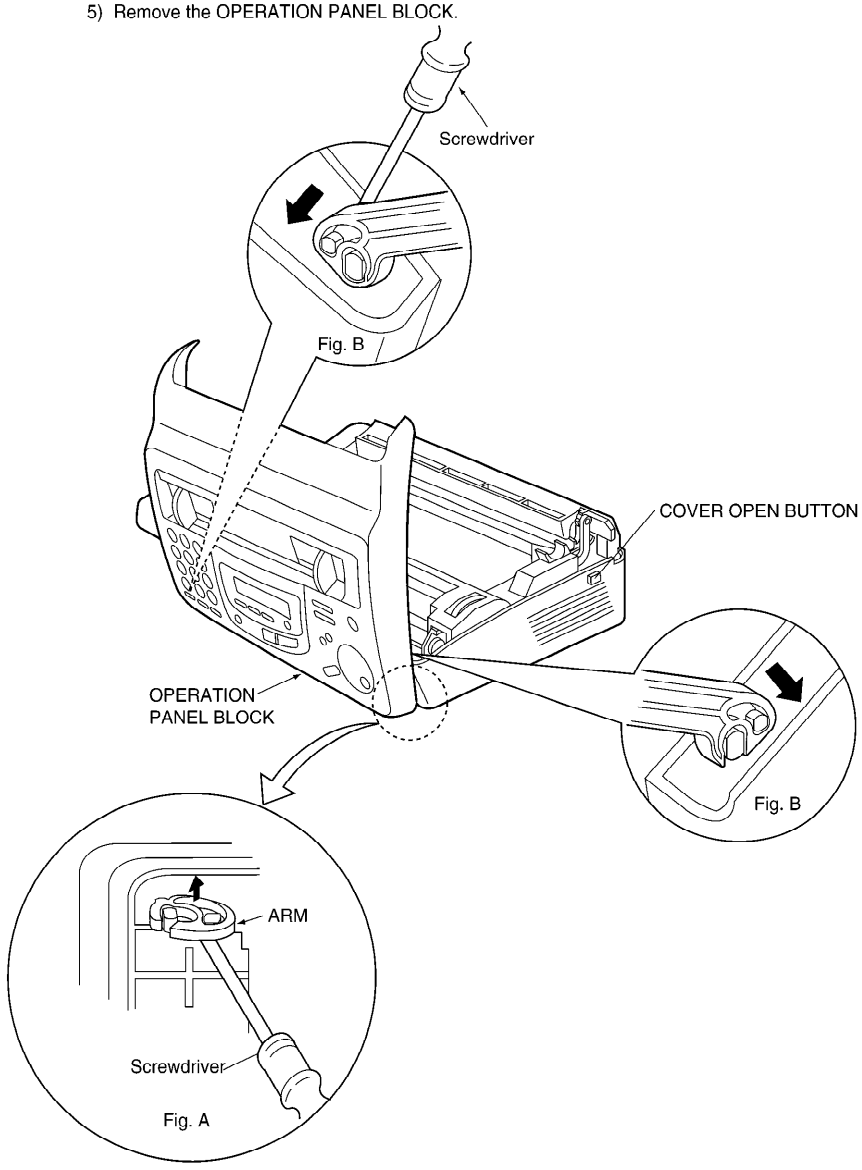


5.2. HOW TO REMOVE THE OPERATION PANEL BLOCK

Procedure 2

Ref. No. 2

1) Unhook all the connectors connecting the main cabinet with the OPERATION PANEL BLOCK .
2) Push the cover open button in the direction of the arrow to open the operation block.
3) Tilt the unit vertically so that its left side faces down the grey-shaded ARM as illustrated in Fig. A, insert a screwdriver and unlatch the ARM as illustrated in Fig. A.
4) Pull out both sides of the arms (in the direction of the arrow shown in Fig. B.
5) Remove the OPERATION PANEL BLOCK.

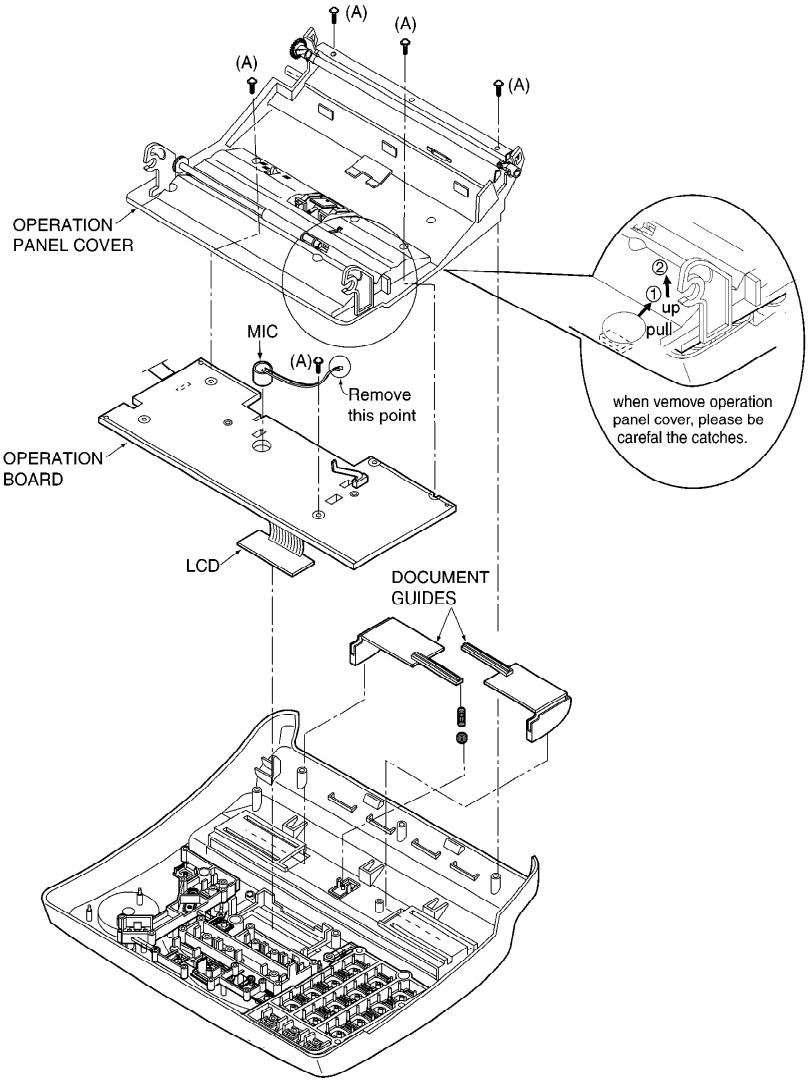


5.3. HOW TO REMOVE THE OPERATION BOARD AND LCD

Procedure 2→3

Ref. No. 3

1) Remove the 5 screws (A) and the operation panel cover .
2) Remove the mic read wire.
3) Remove the operation board.
4) Remove the document guides.

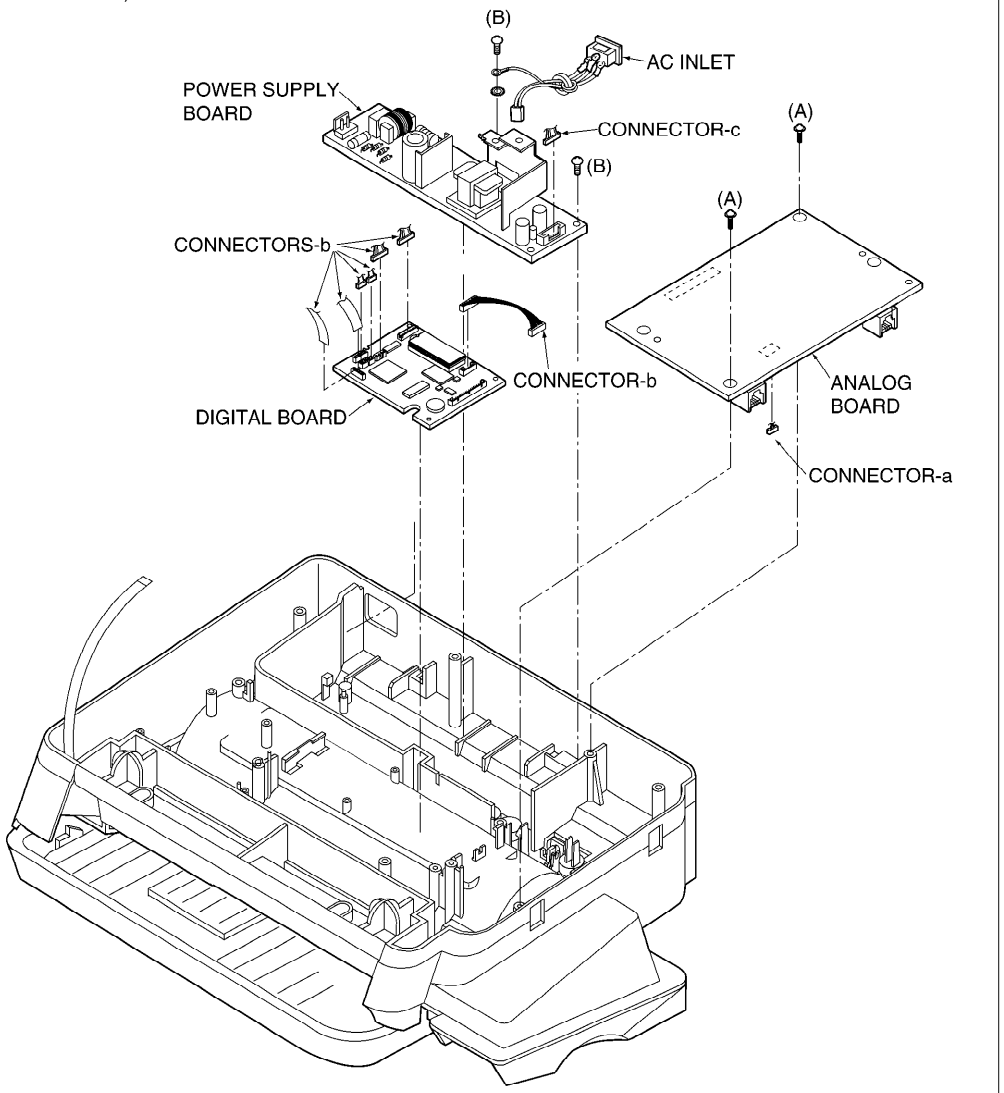


5.4. HOW TO REMOVE THE DIGITAL, ANALOG AND POWER SUPPLY BOARD AND AC INLET

Procedure 1→4

Ref. No. 4

1) Remove the 2 screws (A).
2) Remove the connector-a.
3) Remove the ANALOG BOARD.
4) Remove the connectors-b.
5) Remove the DIGITAL BOARD.
6) Remove the 1 csrew (B).
7) Remove the connector-c.
8) Remove the POWER SUPPLY BOARD.
9) Remove the AC INLET.

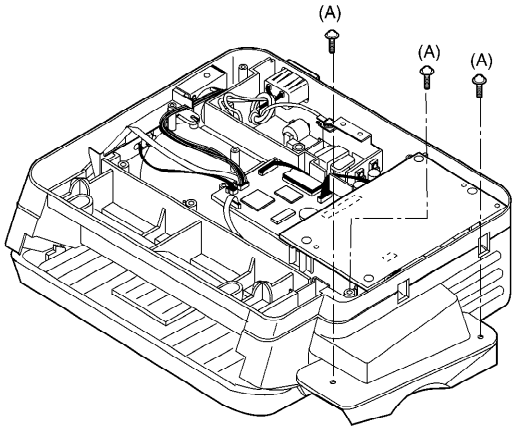


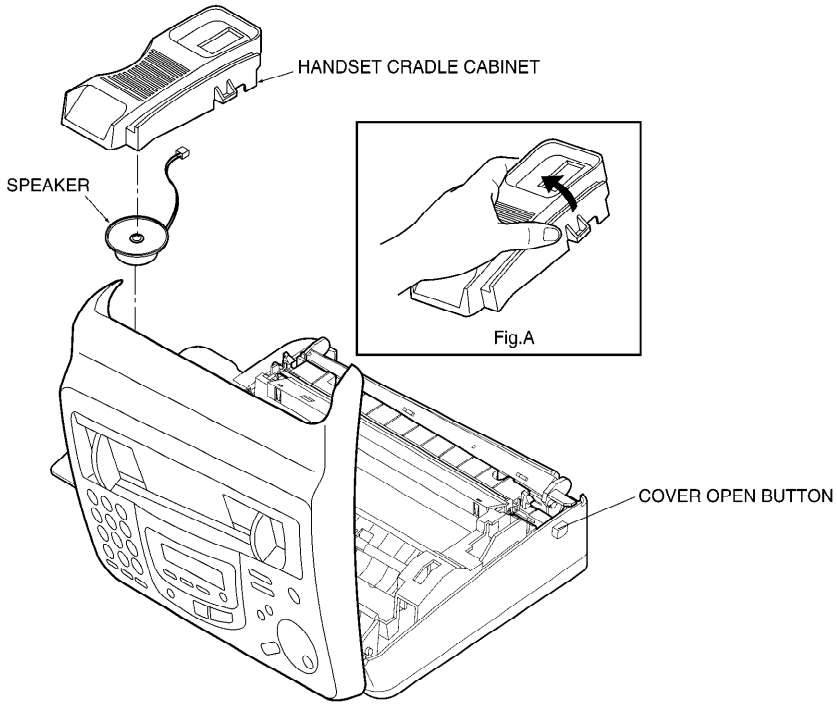
5.5. HOW TO REMOVE THE HANDSET CRADLE CABINET AND SPEAKER

Procedure 1→5

Ref. No. 5

1) Remove the 3 screws (A).
2) Push the cover open button.
3) Remove the HANDSET CRADIE CABINET.(see Fig.A).
4) Remove the SPEAKER.





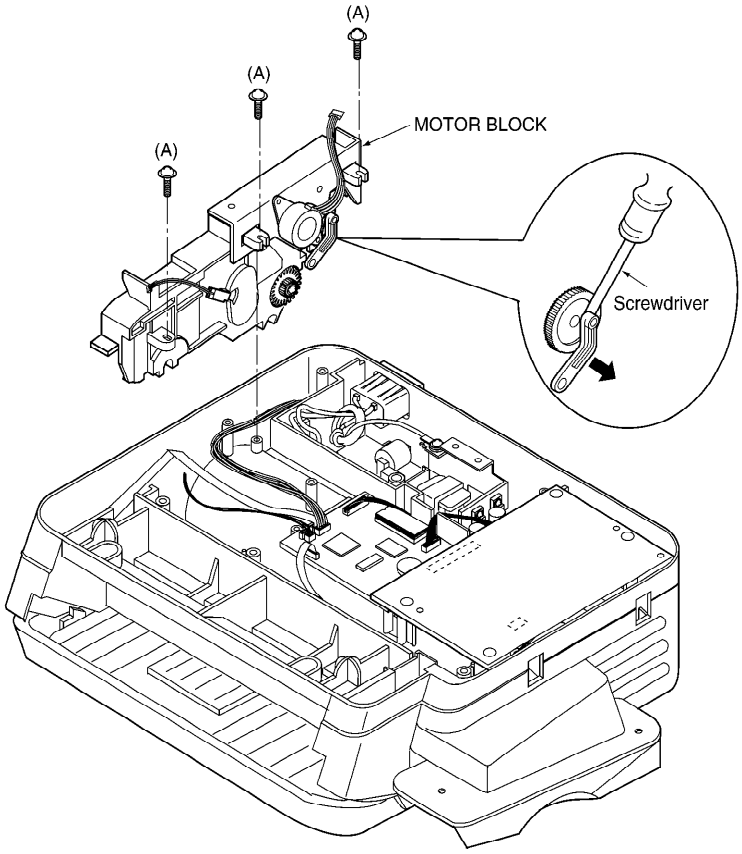
5.6. HOW TO REMOVE THE MOTOR BLOCK

Procedure 1→6

Ref. No. 6

1) Remove the 3 screw (A).
2) Remove the MOTOR BLOCK.

Note: When install the Motor Block into the unit, Please refer to **4.9.HOW TO REMOVE THE THERMAL HEAD AND CUTTER BLOCK**.



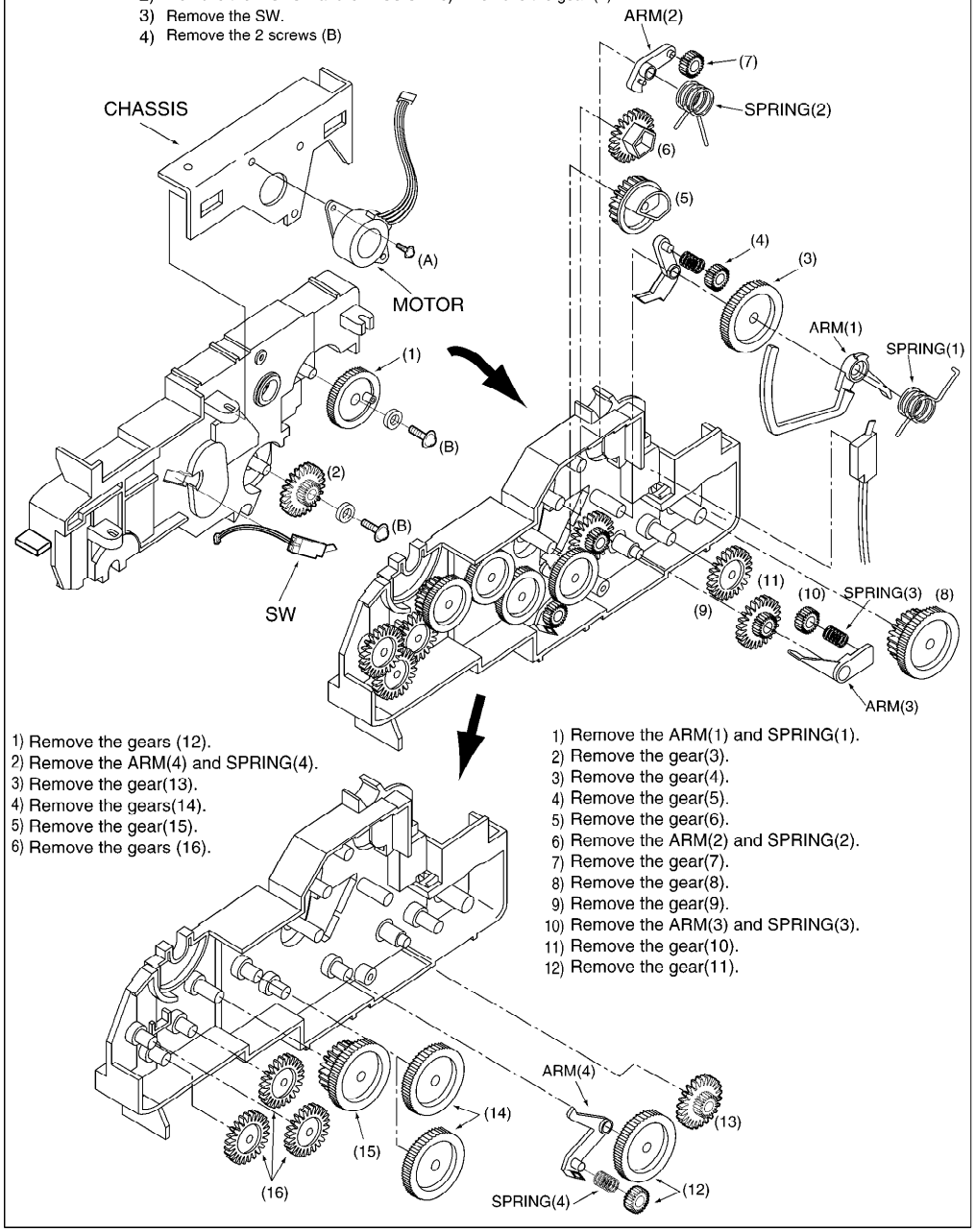
CROSS REFERENCE:

HOW TO REMOVE THE THERMAL HEAD AND CUTTER BLOCK ()

Procedure 1→6→6(a)

Ref. No. 6 (a)

1) Remove the screw (A).
2) Remove the MOTOR and CHASSIS.
3) Remove the SW.
4) Remove the 2 screws (B)
5) Remove the gear (1).
6) Remove the gear (2).



1) Remove the gears (12).
2) Remove the ARM(4) and SPRING(4).
3) Remove the gear(13).
4) Remove the gears(14).
5) Remove the gear(15).
6) Remove the gears (16).

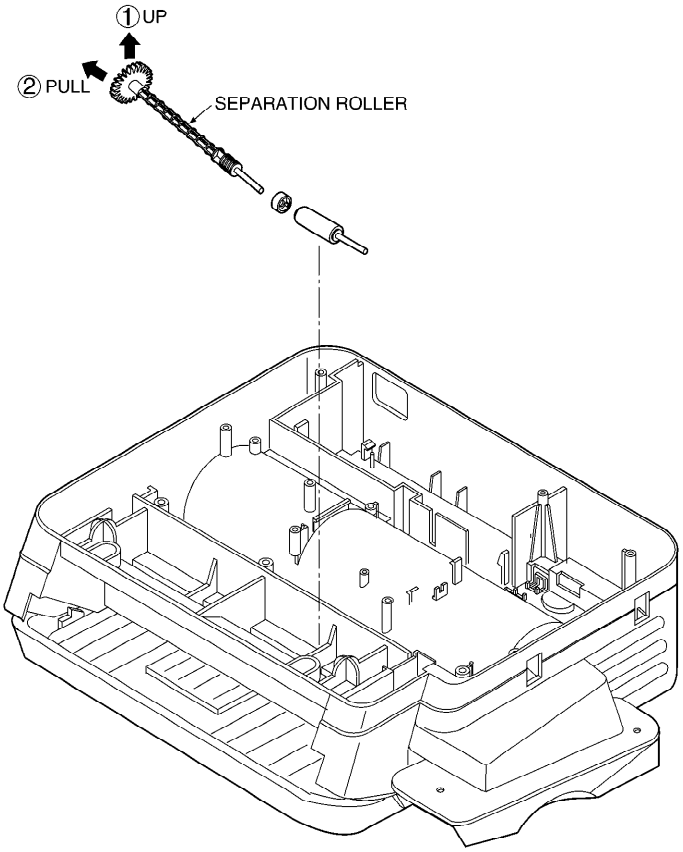
1) Remove the ARM(1) and SPRING(1).
2) Remove the gear(3).
3) Remove the gear(4).
4) Remove the gear(5).
5) Remove the gear(6).
6) Remove the ARM(2) and SPRING(2).
7) Remove the gear(7).
8) Remove the gear(8).
9) Remove the gear(9).
10) Remove the ARM(3) and SPRING(3).
11) Remove the gear(10).
12) Remove the gear(11).

5.7. HOW TO REMOVE THE ROLLERS

Procedure 1→4→6→7

Ref. No. 7

1) Remove the SEPARATION ROLLER.

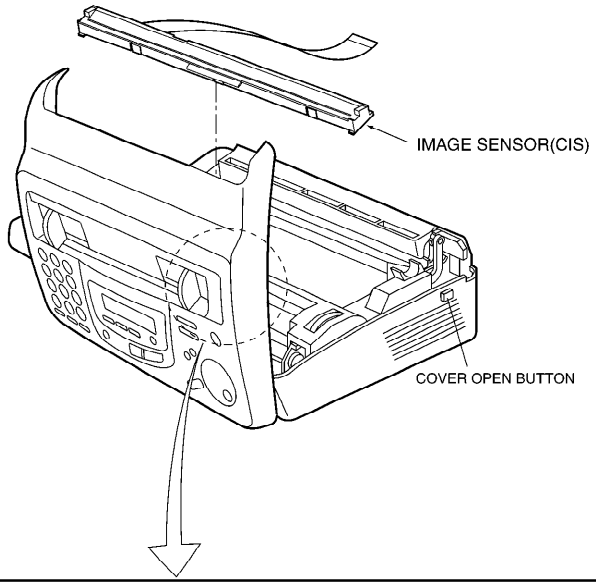


5.8. HOW TO REMOVE THE IMAGE SENSOR

Procedure 1→4→8

Ref. No. 8

1) Push the cover open button.
2) Remove the image sensor (Refer to Fig.A.)



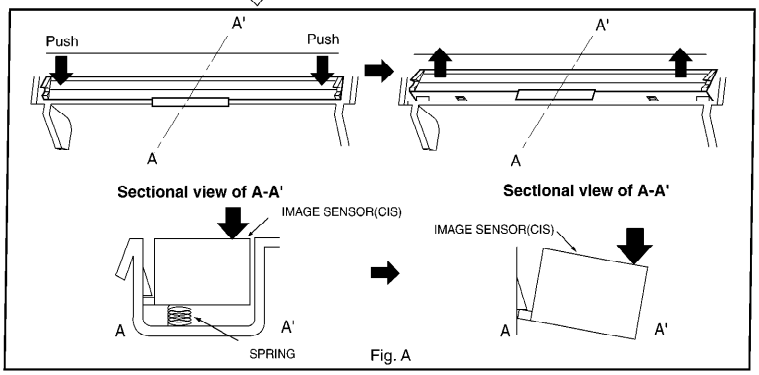


Fig. A

HOW TO INSTALL THE IMAGE SENSOR

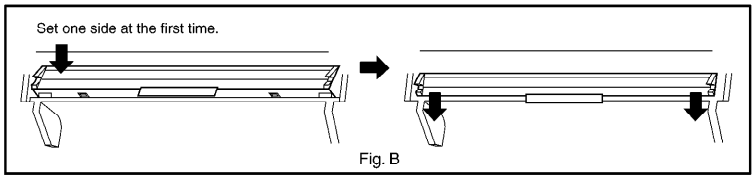


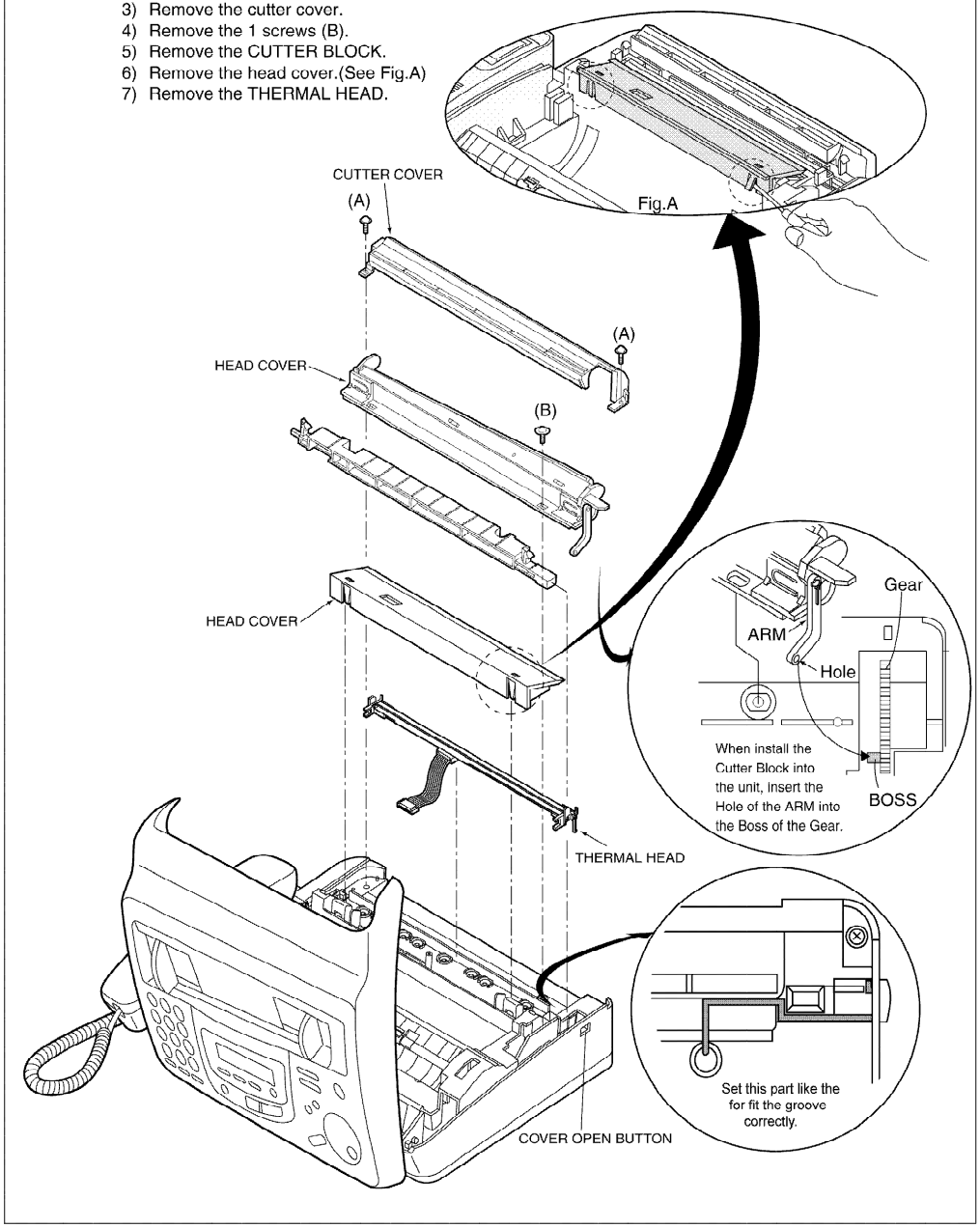
Fig. B

5.9. HOW TO REMOVE THE THERMAL HEAD AND CUTTER BLOCK

Procedure 9

Ref. No. 9

1) Push the cover open button.
2) Remove the 2 screws (A).
3) Remove the cutter cover.
4) Remove the 1 screws (B).
5) Remove the CUTTER BLOCK.
6) Remove the head cover.(See Fig.A)
7) Remove the THERMAL HEAD.

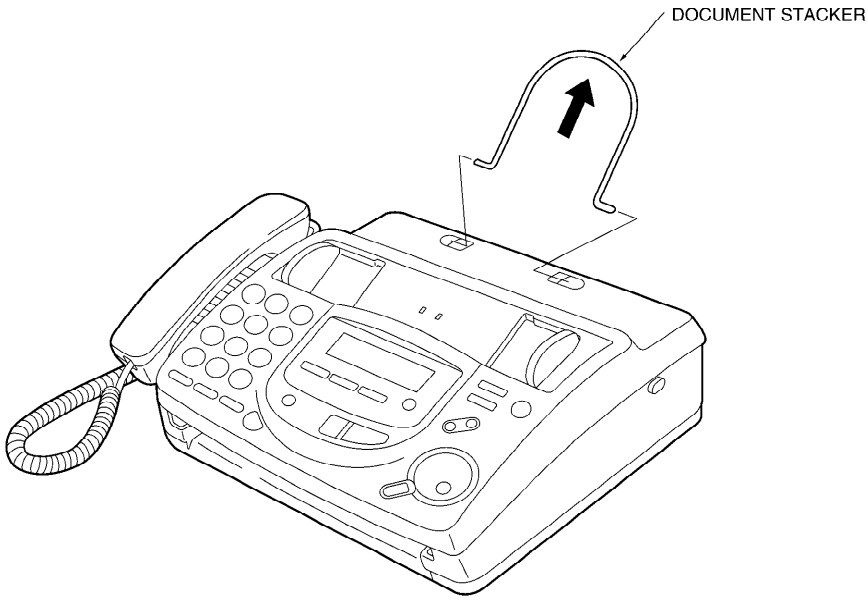


5.10. HOW TO REMOVE THE DOCUMENT STACKER

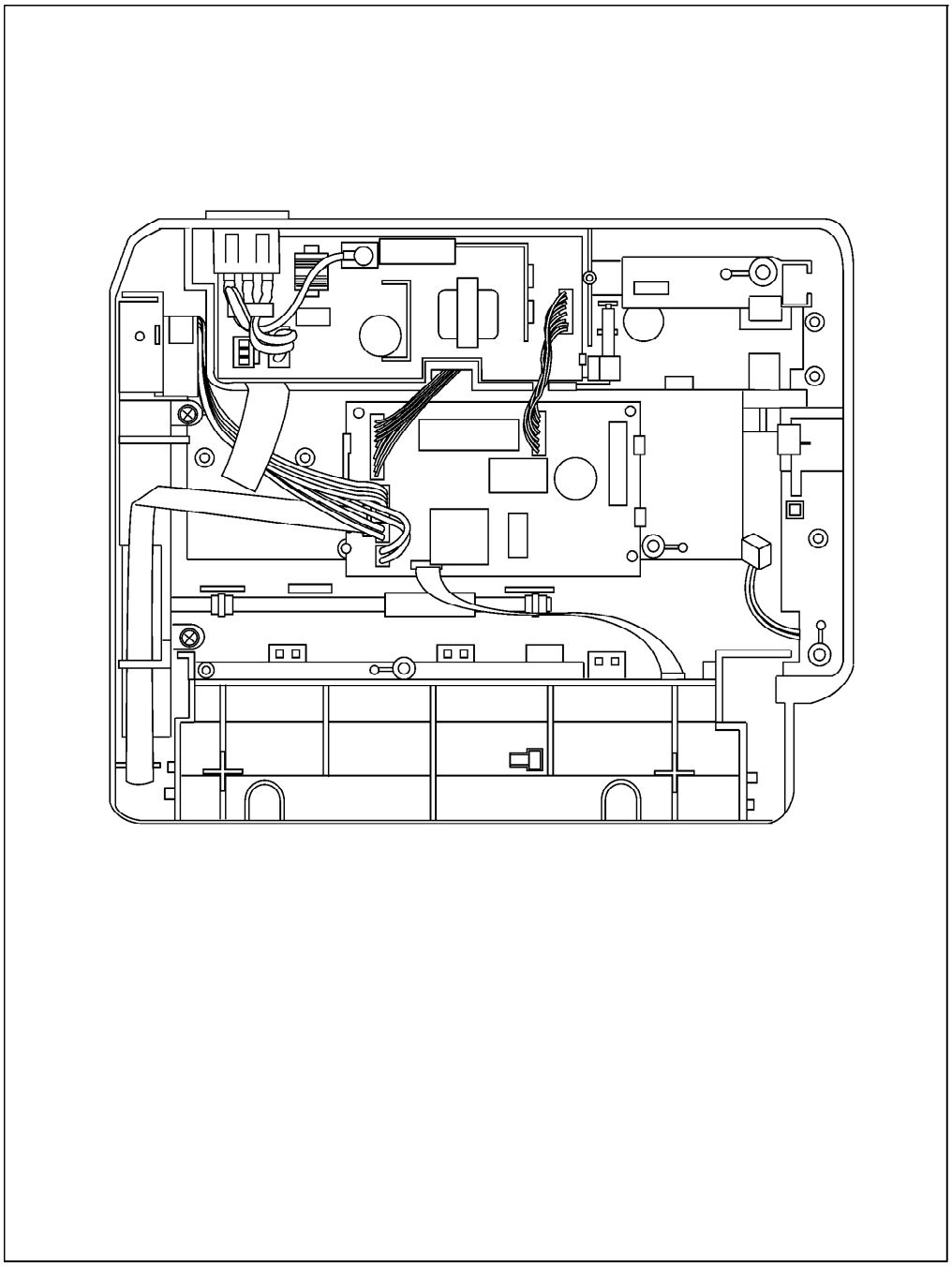
Procedure 10

Ref. No. 10

1) Push the bottom of the DOCUMENT STACKER in the direction of the arrows.



5.11. INSTALLATION POSITION OF THE LEAD WIRES



6. HOW TO REPLACE THE FLAT PACKAGE IC

If you do not have the special tools (for example: SPOT HEATER) to remove the SPOT HEATER'S Flat IC, if you have solder (large amount), a soldering iron, and a cutter knife, you can easily remove the ICs even if there are more than 100 pins.

6.1. PREPARATION

- SOLDER

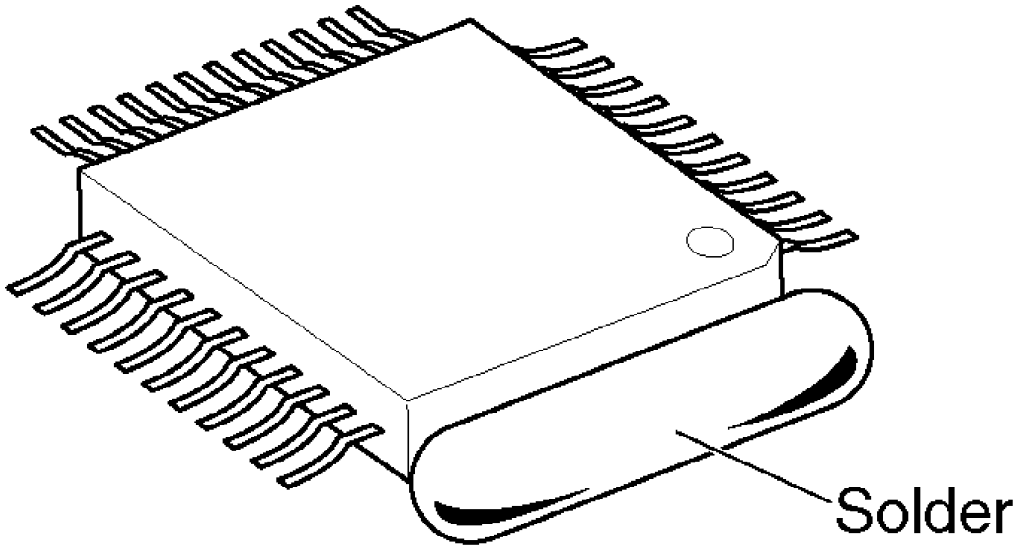
Sparkle Solder 115A-1, 115B-1 OR Almit Solder KR-19, KR-19RMA

- Soldering iron
  Recommended power consumption is between 30 W to 40 W. / Temperature of Copper Rod 662 ± 50°F (350 ± 10°C) / (An expert may handle a 60~80 W iron, but a beginner might damage the foil by overheating.)
- Flux / HI115 Specific gravity 0.863 / (Original flux should be replaced daily.)

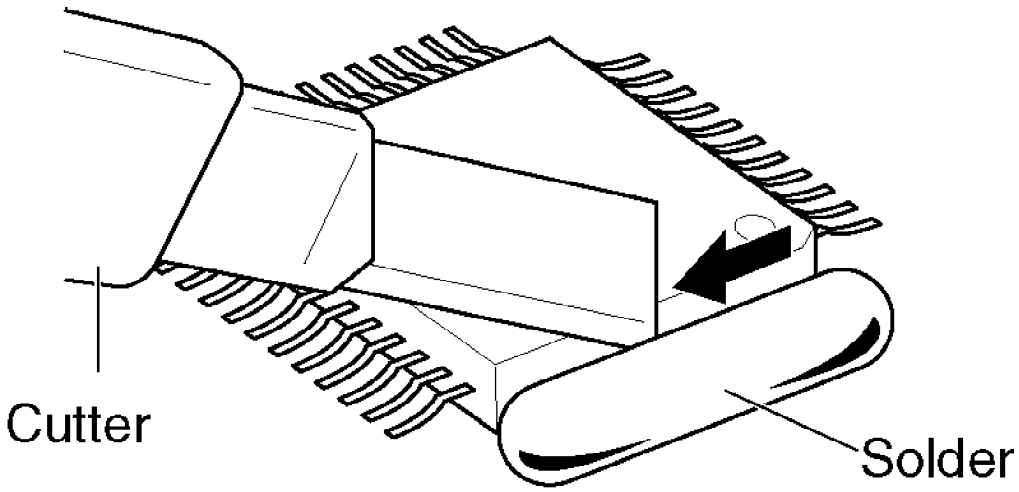
6.2. FLAT PACKAGE IC REMOVAL PROCEDURE

1. When all of the IC lead cannot been seen at the standard degree, fill with large quantities of solder.

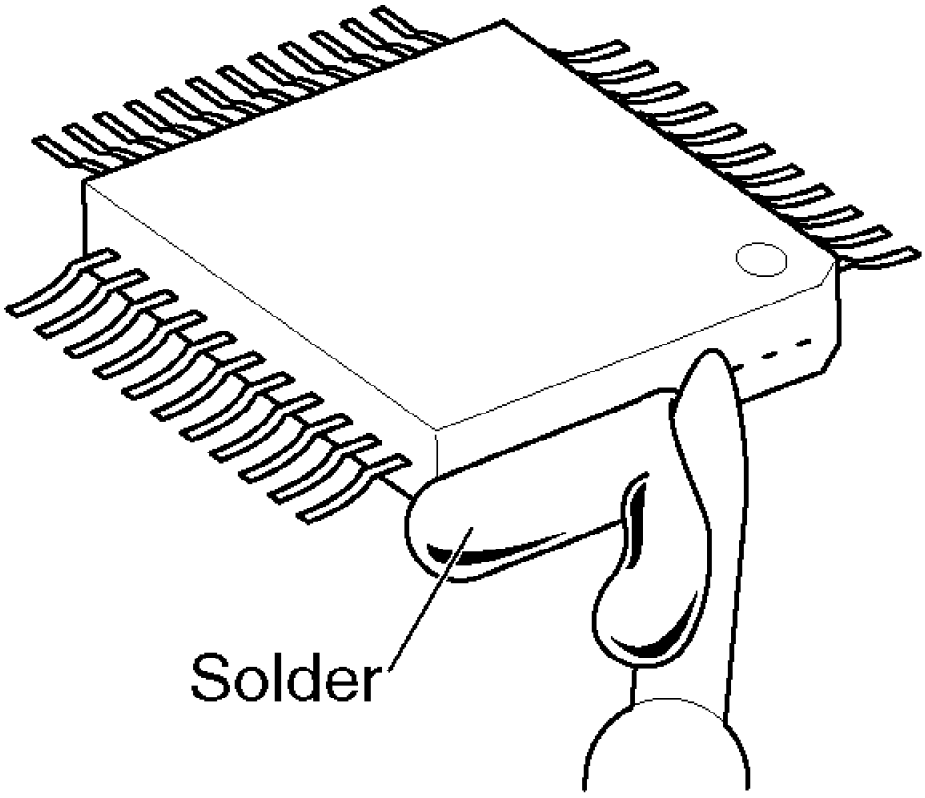
Note:
If you do not fill with solder and directly cut the IC lead with the cutter, stress may build up directly in the P.C. board's pattern. If you do not fill with large quantities of solder as in step 1, the P.C. board pattern may be removed.



2. Using a cutter, cut the lead at the source. (Cut the contents with a cutter lightly, 5 or 6 times.)



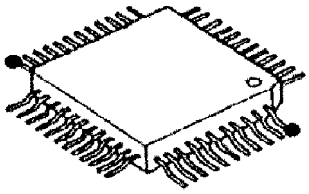
3. Remove when the solder melts. (Remove the lead at the same time.)



After removing the Flat IC and when attaching a new IC, remove any of the excess solder on the land using the soldering wire, etc. If the excess solder is not removed from the land, the IC will slip and not be attached properly

6.3. FLAT PACKAGE IC INSTALLATION PROCEDURE

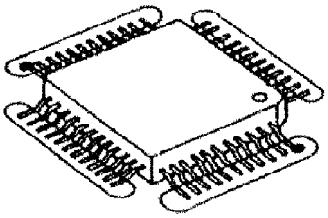
1) Temporarily fix the FLAT PACKAGE IC by soldering on the two marked pins.



● ———— Temporary soldering point.

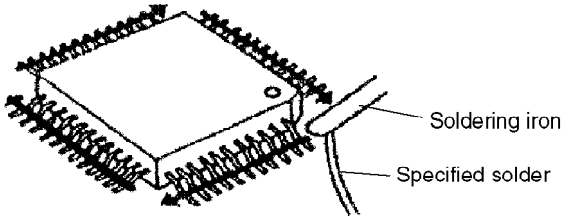
*Check the accuracy of the IC setting with the corresponding soldering foil.

2) Apply flux to all pins of the FLAT PACKAGE IC.



———— Flux

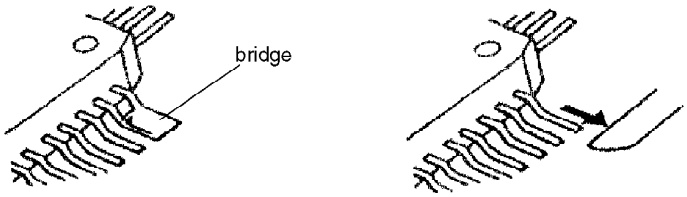
3) Solder using the specified solder, in the direction of the arrow, by sliding the soldering iron.



6.4. BRIDGE MODIFICATION PROCEDURE

1) Lightly re-solder the bridged portion.

2) Remove the remaining solder along the pins using a soldering iron as shown in the figure below.



7. CIRCUIT OPERATIONS

7.1. CONNECTION DIAGRAM

7.2. GENERAL BLOCK DIAGRAM

The control section will be explained as shown in the block diagram.

1. ASIC (IC1)

Composed mainly of an address decoder, modem control section, CPU and RTC.

Controls the general FAX operations.

Controls the operation panel I/F.

Controls the thermal head I/F and CIS I/F.
Executes image processing.
TAM monitor and the H/S volume.
I/O ports

2. ROM (IC2)
Contains all of the program instructions for unit operations.

3. Static RAM (IC4)
This memory is used mainly for the parameter working storage area.

4. MODEM (IC5)
Modem for the FAX.

5. Read Section
Contact Image Sensor (CIS) to read transmitting documents.

6. Thermal Head
Contains heating elements for dot matrix image printing.

7. Motor driver (IC8)
Drives the motor.

8. Reset circuit (IC3)
Detects voltage at 5V power source, outputs the signal, which provides the reset signal for each IC to IC1.

9. Analog board
Composed of an ITS circuit and NCU circuit.

10. Sensor Section
Composed of a document sensor, recording paper sensor, motor position sensors, read position sensor.

11. Power supply switching board section
Supplies +5V and +24V to the unit.

12. FLASH MEMORY (IC6)
Saves TAM voice data.

7.2.1. GENERAL BLOCK DIAGRAM

7.3. CONTROL SECTION

7.3.1. BLOCK DIAGRAM

7.3.2. ASIC (IC1)

This custom IC is used for general FAX operations.

1. **CPU**
   This model uses a Z80 equivalent CPU operating at 8MHz. / Many of the peripheral functions are handled by custom designed LSIs. As a result, the CPU only needs to process the result.
2. **RTC**
   Real time clock.
3. **DECODER**
   Decodes the address.
4. **ROM/RAM I/F**
   Controls the SELECT signal of ROM or RAM and bank switching.
5. **CIS I/F**
   Controls document reading.
6. **IMAGE DATA RAM**
   This is inside the ASIC and has 8KB which is used for image processing.
7. **THERMAL HEAD I/F**
   Transmits the recorded data to the thermal head.
8. **MOTOR I/F**
   Controls the motor which feeds the document and feeds the reading document.
9. **OPERATION PANEL I/F**
   Control port for Operation Panel.
10. **I/O PORT**
    I/O Port Interface (for analog board port control).
11. **ANALOG BLOCK**
    Electronic volume for the handset and TAM monitor. / Sends beep tones, etc.

Descriptions of Pin Distribution (IC1)

NO	SIGNAL	I/O	POWER SUPPLIED VOLTAGE	DESCRIPTION
1	AIN1	A	3.3V	CCD IMAGE SIGNAL INPUT
2	AIN2	A	3.3V	THERMISTOR TEMPERATURE WAT(INPUT
3	AIN3	A	3.3V	
4	AMON	A	3.3V	ANALOG SIGNAL MONITOR TERMIN
5	VSSB		GND	POWER SOURCE (ANALOG GND)
6	VDDB		3.3V	POWER SOURCE (ANALOG 3.3V)
7	VDD(3.3V/B)		3.3V/BATT	POWER SOURCE (+3.3V/LITHIUM BATTERY)
8	X32OUT	O	3.3V/BATT	RTC (32.768KHz) CONNECTION
9	X32IN	I	3.3V/BATT	RTC (32.768KHz) CONNECTION
10	VSS		GND	GND
11	XBACEN	I	5V/BATT	BACKUP ENABLE
12	VDD(5V/B)		5V/BATT	POWER SOURCE (+5V/LITHIUM BATTERY)
13	XRAMCS	O	5V/BATT	RAM (IC4) CHIP SELECT
14	FTG	O	5V	SH SIGNAL OUTPUT FOR CIS (SI)
15	F1	O	5V	01SIGNAL OUTPUT FOR CIS(CLK)
16	F2/OP	O	5V	OUTPUT PORT (LED ON)
17	FR/OP	O	5V	ACK (DTMF RECEIVER CONTROL)
18	CPC	I	5V	INPUT PORT (CPC)
19	VDD(5V)		5V	POWER SOURCE (+5V)
20	VSS		5V	POWER SOURCE (GND)
21	RVN	I	5V	INPUT PORT (CISSEL)
22	IRDATXD/IOP	I	5V	INPUT PORT (JAM)
23	IRDARXD/IOP80	O	5V	OUTPUT PORT
24	TXD/IOP	O	5V	OUTPUT PORT
25	RXD/IOP	O	5V	OUTPUT PORT (TELRXENB)
26	XRTS/IOP	O	5V	OUTPUT PORT (P-SHORT)
27	XCTS/IOP	O	5V	OUTPUT PORT (MDMTXENB)
28	MIDAT/IOP	O	5V	OUTPUT PORT (TONE1ENB)
29	MICLK/IOP	O	5V	OUTPUT PORT (TONE2ENB)
30	TONE1	A	5V	TONE OUTPUT
31	TONE2	A	5V	TONE OUTPUT
32	VOLUREF	A	5V	ANALOG REF VOLTAGE
33	VOLUOUT	A	5V	VOLUME OUTPUT
34	VOLUIN	A	5V	VOLUME INPUT
35	MILAT/IOP	O	5V	OUTPUT PORT (H/S RXENB)
36	XNMI	I	5V	HIGH FIXED
37	FMEMDO/IOP	O	5V	ALE (FLASH MEMORY CONTROL)
38	FMEMDI/IOP	O	5V	FLASH MEMORY (IC6) CHIP SELECT
39	FMEMCLK/IOP	I	5V	INPUT PORT (BELL) R/B (FLASH MEMORY CONTROL)

NO	SIGNAL	I/O	POWER SUPPLIED VOLTAGE	DESCRIPTION
40	VSS		GND	POWER SOURCE (GND)
41	VDD(5V)		5V	POWER SOURCE (+5V)
42	20KOSC/IOP	O	5V	CLE (FLASH MEMORY CONTROL)
43	XWAIT	I	5V	INPUT PORT (HOOK)
44	HSTRD/IOP	O	5V	FRD (FLASH MEMORY RD)
45	HSTWR/IOP	O	5V	FWR (FLASH MEMORY WR)
46	XOPRBE	O	5V	OUTPUT PORT (SP-MUTE)
47	ADR15	O	5V	CPU ADDRESS BUS 15 (NOT USED)
48	ADR14	O	5V	CPU ADDRESS BUS 14 (NOT USED)
49	ADR13	O	5V	CPU ADDRESS BUS 13 (NOT USED)
50	VDD(3.3V)		3.3V	POWER SOURCE (+3.3V)
51	XOUT	O	3.3V	SYSTEM CLOCK (24MHz)
52	XIN	I	3.3V	SYSTEM CLOCK (24MHz)
53	VSS		GND	POWER SOURCE (GND)
54	VDD(5V)		5V	POWER SOURCE (+5V)
55	XTEST	O	5V	24MHz CLOCK
56	TEST1	I	5V	HIGH FIXED
57	TEST2	I	5V	HIGH FIXED
58	TEST3	I	5V	HIGH FIXED
59	TEST4	I	5V	HIGH FIXED
60	XMDMINT	I	5V	MODEM INTERRUPT
61	XMDMCS	O	5V	MODEM (IC5) CHIP SELECT
62	VSS		GND	POWER SOURCE (GND)
63	VDD(3.3V)		3.3V	POWER SOURCE (+3.3V)
64	XRAS/IOP	O	5V	MODEM RESET
65	XCAS1/IOP	O	5V	SD (Serial Data from DTMF Receiver
66	XCAS2/IOP	I	5V	INPUT PORT (BELL)
67	XRESCS2	O	5V	OPRESET
68	DB3	I/O	5V	CPU DATA BUS 3
69	DB2	I/O	5V	CPU DATA BUS 2
70	DB4	I/O	5V	CPU DATA BUS 4
71	DB1	I/O	5V	CPU DATA BUS 1
72	DB5	I/O	5V	CPU DATA BUS 5
73	DB0	I/O	5V	CPU DATA BUS 0
74	DB6	I/O	5V	CPU DATA BUS 6
75	VSS		GND	POWER SOURCE (GND)
76	VDD (3.3V)		3.3V	POWER SOURCE (+3.3V)
77	DB7	I/O	5V	CPU DATA BUS 7
78	XROMCS	I/O	5V	ROM (IC2) CHIP SELECT
79	RD	O	5V	CPU RD
80	WR	O	5V	CPU WR
81	VSS		GND	POWER SOURCE (GND)
82	VDD (5V)		5V	POWER SOURCE (+5V)

NO	SIGNAL	I/O	POWER SUPPLIED VOLTAGE	DESCRIPTION
83	ADR0	O	5V	CPU ADDRESS BUS 0
84	ADR1	O	5V	CPU ADDRESS BUS 1
85	ADR2	O	5V	CPU ADDRESS BUS 2
86	ADR3	O	5V	CPU ADDRESS BUS 3
87	ADR4	O	5V	CPU ADDRESS BUS 4
88	ADR5	O	5V	CPU ADDRESS BUS 5
89	ADR6	O	5V	CPU ADDRESS BUS 6
90	ADR7	O	5V	CPU ADDRESS BUS 7
91	ADR8	O	5V	CPU ADDRESS BUS 8
92	ADR9	O	5V	CPU ADDRESS 9
93	ADR10	O	5V	CPU ADDRESS 10
94	ADR11	O	5V	CPU ADDRESS 11
95	ADR12	O	5V	CPU ADDRESS 12
96	VSS		GND	POWER SOURCE (GND)
97	VDD (5V)		5V	POWER SOURCE (+5V)
98	RBA0	O	5V	ROM/RAM BANK ADDRESS 0
99	RBA1	O	5V	ROM/RAM BANK ADDRESS 1
100	RBA2	O	5V	ROM/RAM BANK ADDRESS 2
101	RBA3	O	5V	ROM/RAM BANK ADDRESS 3
102	RBA4	O	5V	ROM/RAM BANK ADDRESS 4
103	RBA5	O	5V	ROM/RAM BANK ADDRESS 5
104	RBA6/IOP96	I	5V	INPUT PORT (PAPER)
105	STB1	O	5V	STROBE SIGNAL OUTPUT TO THER HEAD
106	STB2	O	5V	STROBE SIGNAL OUTPUT TO THER HEAD
107	STB3	O	5V	STROBE SIGNAL OUTPUT TO THER HEAD
108	XRESET	I	5V	RESET INPUT
109	XORESET	O	5V	RESET OUTPUT
110	VDD (5V)		5V	POWER SOURCE (+5V)
111	VSS		GND	POWER SOURCE (GND)
112	XRESET1	I	5V	RESET INPUT
113	WDERR	O	5V	WATCHED ERROR OUTPUT SIGNAL
114	THDAT	O	5V	RECORDED IMAGE OUTPUT
115	THCLK	O	5V	CLOCK OUTPUT FOR DATA TRANSI
116	VDD (3.3V)		3.3V	POWER SOURCE (3.3V)
117	VSS		GND	POWER SOURCE (GND)
118	THLAT	O	5V	PULSE OUTPUT FOR DATA LATCH
119	STBNP	I	5V	INPUT PORT (MOTOR POS.)
120	RM0/IOP	O	5V	MOTOR CONTROL (D)
121	RM1/IOP	O	5V	MOTOR CONTROL (C)
122	RM2/IOP	O	5V	MOTOR CONTROL (B)

NO	SIGNAL	I/O	POWER SUPPLIED VOLTAGE	DESCRIPTION
123	RM3/IOP	O	5V	MOTOR CONTROL (A)
124	RXE/IOP	O	5V	MOTOR ENABLE SIGNAL
125	TMO	O	5V	OUTPUT PORT (THON)
126	VDD (5V)		5V	POWER SOURCE (+5V)
127	VSS		GND	POWER SOURCE (GND)
128	TM1/IOP	I	5V	INPUT PORT (JOG1)
129	TM2/IOP	I	5V	INPUT PORT (JOG2)
130	TM3/IOP	O	5V	OUTPUT PORT (RLY)
131	TXE/IOP	I	5V	INPUT PORT (CUT. POS.)
132	KSTART	O	5V	OPERATION PANEL CONTROL
133	KLATCH	O	5V	OPERATION PANEL CONTROL
134	KSCLK	O	5V	OPERATION PANEL CONTROL
135	KTXD	O	5V	OPERATION PANEL CONTROL
136	KRXD	I	5V	OPERATION PANEL CONTROL
137	ADSEL1	O	5V	CHANNEL SELECT SIGNAL FOR AI
138	VSSC		GND	POWER SOURCE (ANALOG GND)
139	VDDC		3.3V	POWER SOURCE (ANALOG +3.3V)
140	VSSA		GND	POWER SOURCE (ANALOG GND)
141	VDDA		3.3V	POWER SOURCE (ANALOG +3.3V)
142	VREFB	A	3.3V	A/D CONVERTER'S ZERO STANDAR VOLTAGE OUTPUT
143	VCL	A	3.3V	ANALOG PART STANDARD VOLTA SIGNAL
144	VREFT	A	3.3V	A/D CONVERTER'S FULL SCALE VOLTAGE OUTPUT

7.3.3. ROM (IC2)

This 512 KB ROM (OTPROM or MASKROM) has 32 KB of common area and bank area (BK4~BK 63). / The capacity of each bank is 8 KB. / The addresses of the common area are from 0000H to 7FFFH, and addresses 8000H to 9FFFH are for the bank area.

7.3.4. RAM (IC4)

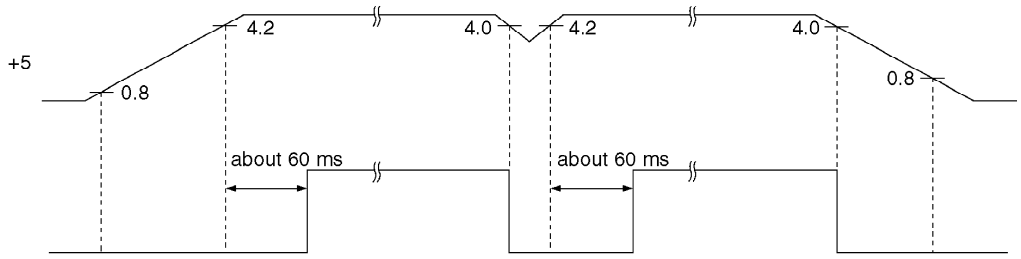
This 32 KB RAM has 8 KB of common area and bank area (BK0, BK1). / The capacity of each bank is 12 KB. / The addresses of the common area are from D000H to EFFFH, and addresses A000H to CFFFH are for the bank area.

7.3.5. RESET CIRCUIT

The output from pin 1 of the Reset IC (IC3) resets the gate array (IC1).

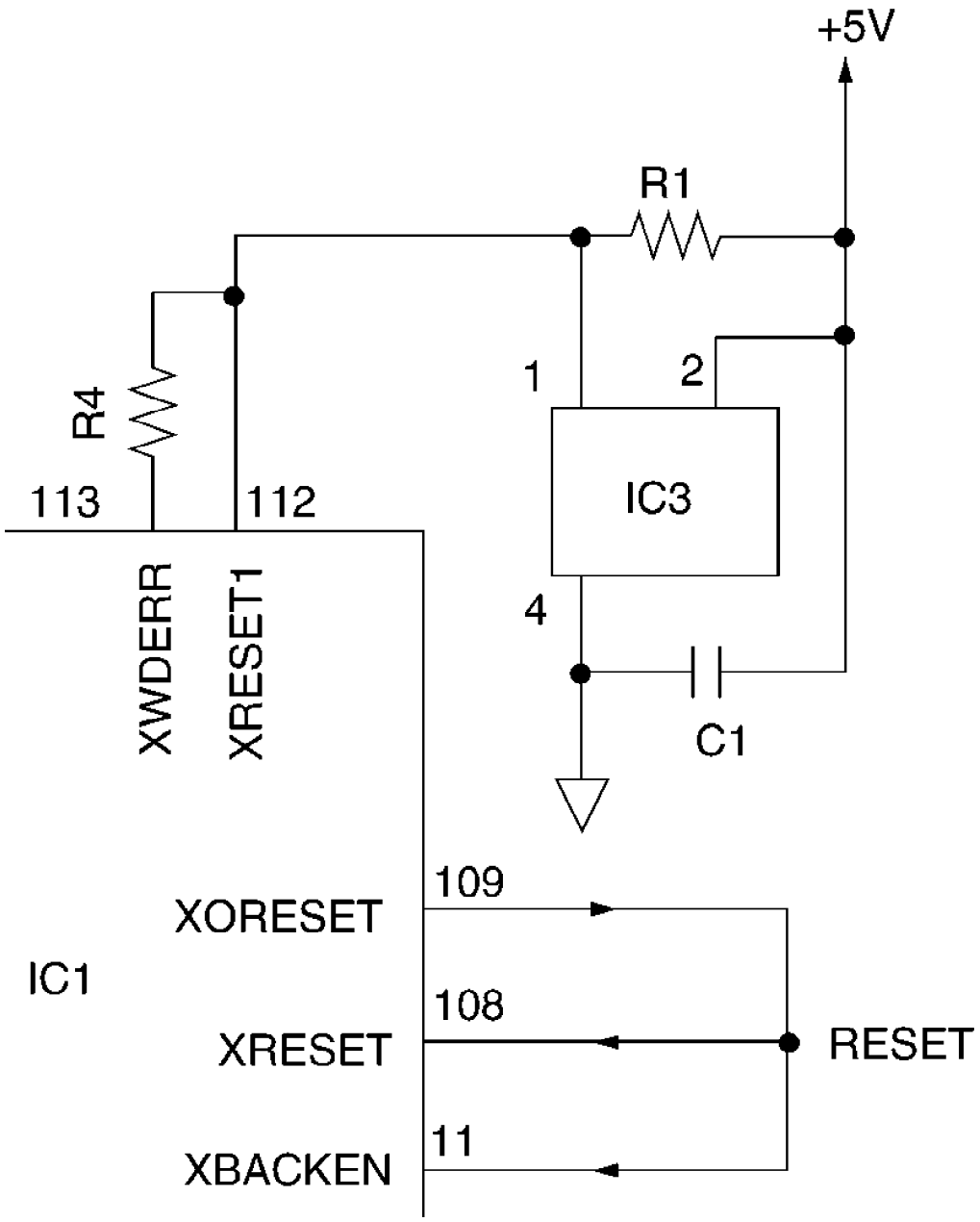
1. **During a power surge, a positive reset pulse of 50 msec or more is generated and the system is reset completely. / This is done to prevent partial resetting and system runaway during a power fluctuation.**

Timing Chart



2. When pin 1 of IC3 becomes low, it will prohibit the RAM (IC4) from changing data. / The RAM (IC4) will go into the backup mode, when it is backed up by a lithium battery.

Circuit Diagram



3. The watch dog timer, built-in the gate array (IC1), is initialized about every 1.5 ms. / When a watch dog error occurs, pin 113 of the gate array (IC1) becomes low. / The terminal of the WDERR signal is connected to the reset line so the WDERR signal works as the reset signal.

7.3.6. SRAM and RTC BACK UP CIRCUIT

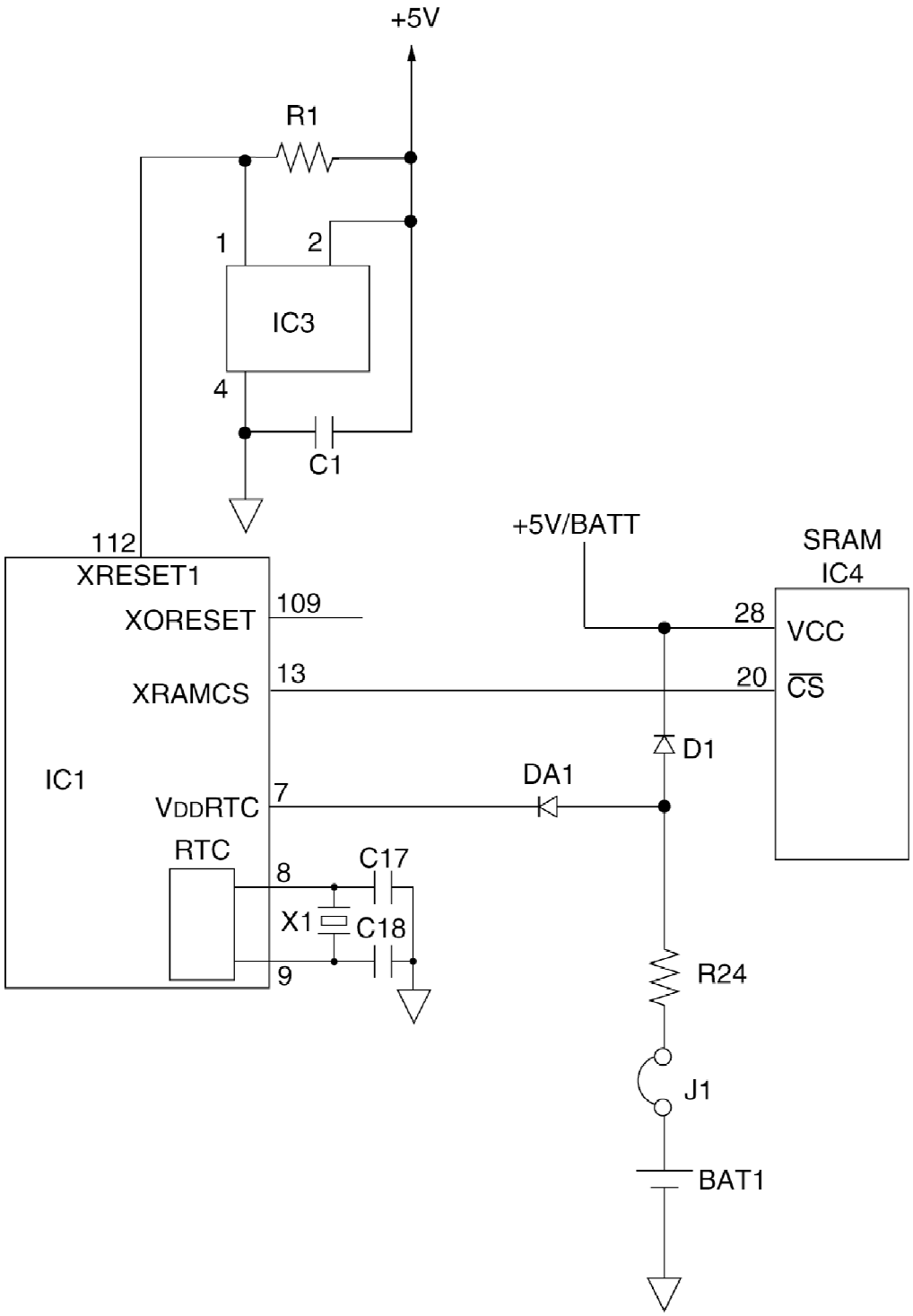
1. Function

This unit has a lithium battery (BAT1) which works for the RAM (IC4) and Real Time Clock (RTC, Integrated into ASIC:IC1). / The user parameter for auto dial numbers, the transmission ID, the system setup date and so on are stored in the RAM (IC4). / The RTC continues functioning, even when the power switch is OFF, backed up by a lithium battery.

2. Circuit Operation

When the power is turned ON, power is supplied RAM (IC4) and RTC (IC1). / At this time, the voltage at pin 28 of RAM is +5V and pin 7 of RTC (IC1) is +3.3V. When the power is turned OFF, the battery supplies the power to RAM and RTC through J1, R24, D1 or DA1. At that time, the voltage at pin 28 of RAM and pin 7 of IC1 are about +2.5V. When the power is OFF and the +5V and +3.3V voltages decrease, IC3 detects them and LOW is input to pin 112 of IC1. Pin 109 of IC1 outputs the reset signals. Pin 28 of RAM (IC4) and pin 11 of IC1 become low, then RAM and RTC (IC1) go into the back up mode, when the power consumption is lower.

Circuit Diagram



7.3.7. SUPERVISION CIRCUIT FOR THE THERMAL HEAD TEMPERATURE

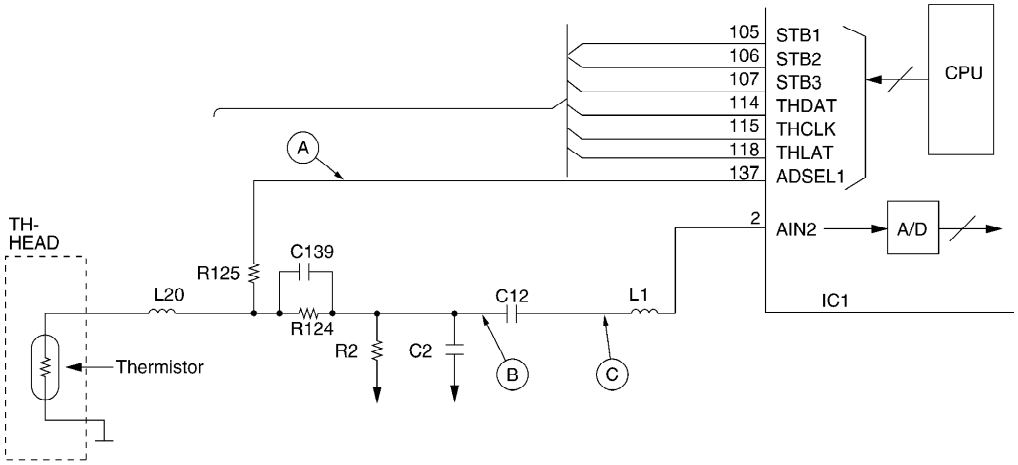
1. Function

The thermistor changes the resistor according to the temperature and uses the thermistor's characteristics. / The output of pin 137

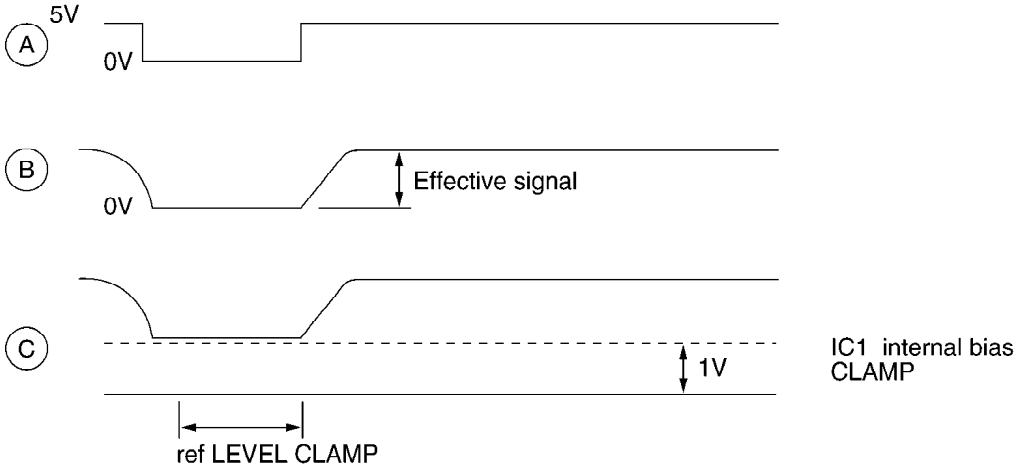
of IC1 becomes a low level. / Then when it becomes a high level, it triggers point (A). / In point (C), according to the voltage output time, the thermal head's temperature is detected.

After the thermal head temperature is converted to voltage in (B), it is then changed to digital data in the A/D converter inside IC1. The CPU decides the strobe width of the thermal head according to this value. Therefore, this circuit can keep the thermal head at an even temperature in order to stabilize the printing density and prevent the head from being overheated.

Circuit Diagram



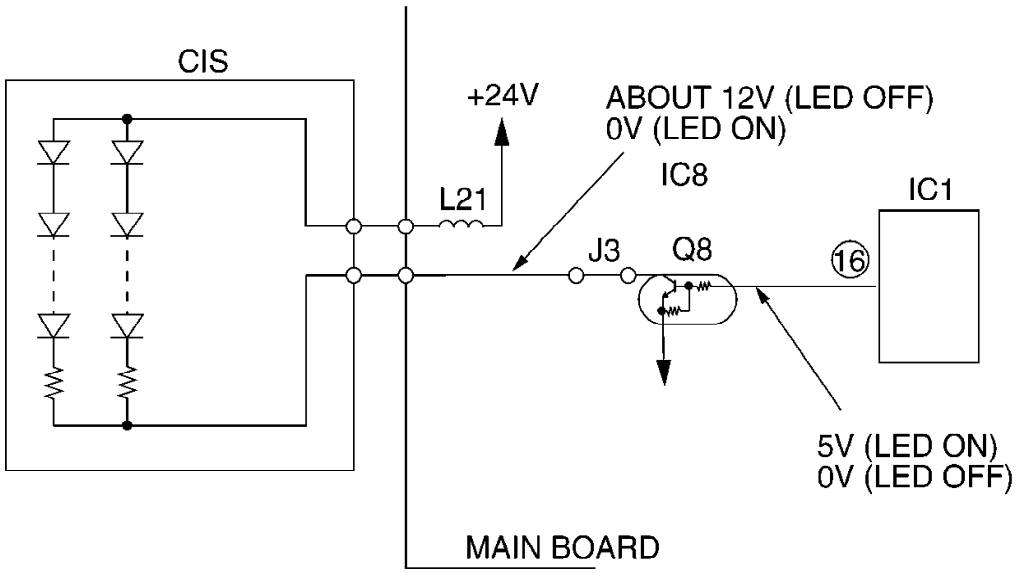
Timing Chart



7.3.8. LED ARRAY(CIS)

The LED ARRAY will light during transmission and copying as a light source to recognize document characters, patterns, or graphics on a document. / It is also possible to light the LED ARRAY in the test mode.

Circuit Diagram



7.4. FACSIMILE SECTION

7.4.1. IMAGE DATA FLOW DURING FACSIMILE OPERATION

COPY (Fine, Super-Fine, Half Tone)

1. **Line information is read by CIS, via route (1), and is input to IC1.**
2. **In IC1, the data is adjusted to a suitable level for A/D conversion in the Analog Signal Processing Section, and via route (2) it is input to A/D conversion (8 bit). After finishing A/D conversion, the data is input to the Image Processing Section via route (3). Then via routes (4) and (5), it is stored in RAM as shading data.**
3. **The draft's information that is read by CIS is input to IC1 via route (1). After it is adjusted to a suitable level for A/D conversion via route (2), the draft's information is converted to A/D (8 bit), and it is input to the Image Processing Section. / The other side, the shading data which flows from RAM via routes (6) and (7), is input to the Image Processing Section. / After finishing the draft's information image processing, white is regarded as "0" and black is regarded as "1". / Then via routes (4) and (5), they are stored in RAM.**
4. **The white/black data stored as above is input to the P/S converter via routes (6) and (8). / The white/black data converted to serial data in the P/S converter is input to the Thermal Head via route (9)**

and is printed out on recording paper.

Note:
Standard: Reads 3.58 times/mm
Fine: Reads 7.7 times/mm
Super-Fine: Reads 15.4 times/mm

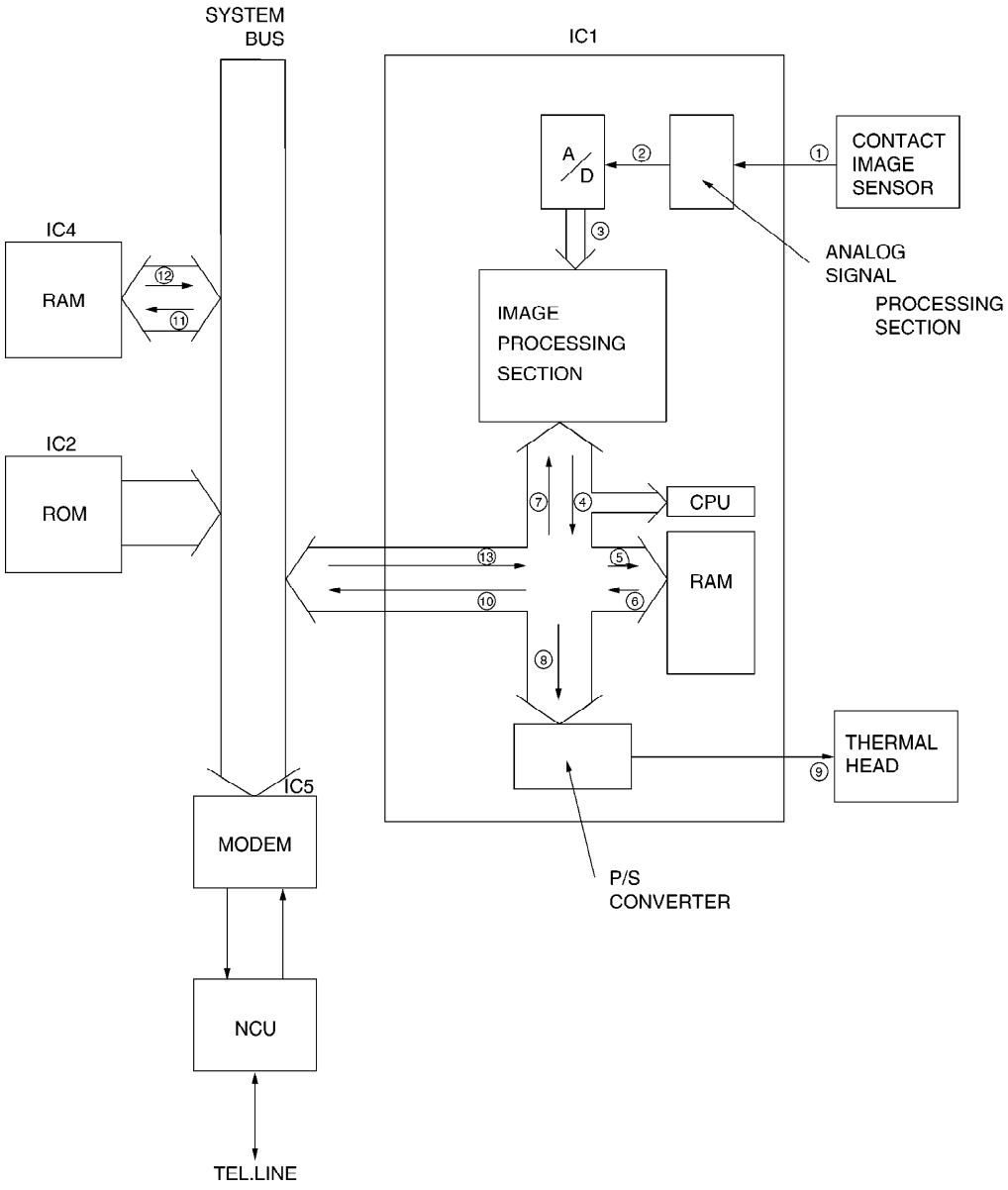
Transmission

1. **Same processing as COPY items 1) - 3).**
2. **The data stored in RAM of IC1 is output from IC1 via routes (6) and (10), and is stored in the system bus. / Via route (11), it is stored in the communication buffer inside RAM (IC4).**
3. **While fetching data stored in the communication buffer synchronous with the modem, the CPU inputs data to the modem along route (12). / It is converted to serial analog data and forwarded over telephone lines via the NCU Section.**

Reception

1. **The serial analog image data is received over telephone lines and input to the modem IC (IC5) via the NCU section, where it is demodulated to parallel digital data. The balance data is sent to the modem. Then the CPU stores the data in the communication buffer of RAM (IC4) along route (11).**
2. **The data stored in RAM (IC4) is decoded by the CPU via route (12), and is stored in RAM by routes (13) and (5).**
3. **Same processing as COPY item 4).**

7.4.2. BLOCK DIAGRAM

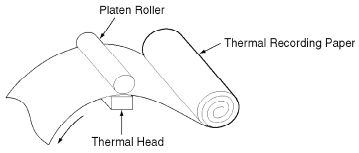


7.4.3. THERMAL HEAD

1. Function

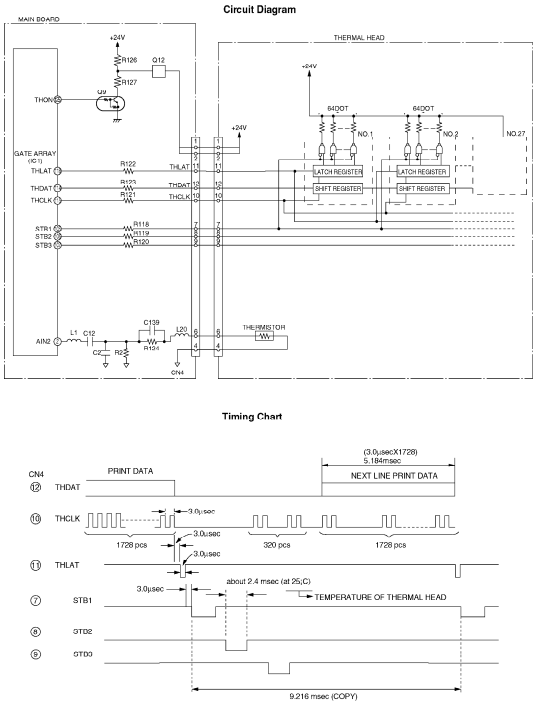
This unit utilizes state of the art thermal printer technology. / The recording paper (roll paper) is chemically processed. When the thermal head contacts this paper it emits heat momentarily, and black dots (appearing like points) are printed on the paper. If this continues, letters and/or diagrams appear, and the original document is reproduced.

COMPOSITION OF THE RECEIVE RECORD SECTION (THERMAL RECORDING FORMAT)



2. Circuit Operation

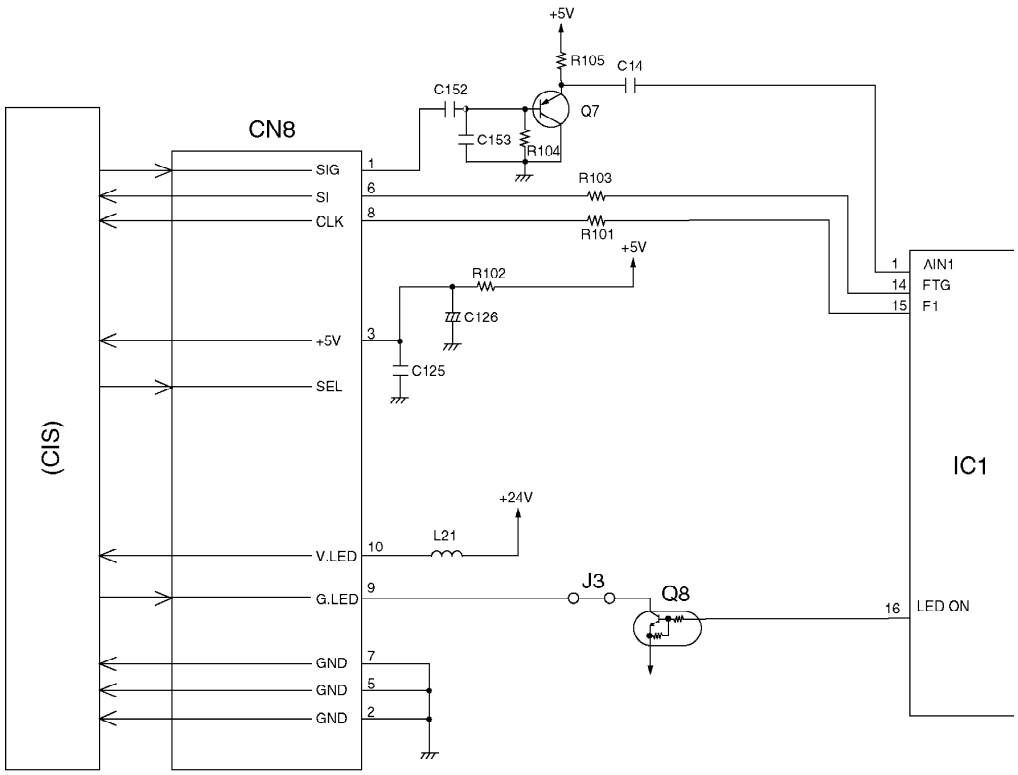
There are 27 driver ICs aligned horizontally on the thermal head and each one of these ICs can drive 64 heat emitting registers. This means that one line is at a density of 64×27=1728 dots=(8 dots/mm). / White/Black (white=0, black=1) data in one line increments is synchronized at IC1 pin 115 (THCLK), and sent from IC1 pin 114 (THDAT) to the shift register of the ICs. The shift registers of the 27 ICs are connected in series, and upon the shift of dot increment 1728, all the shift registers become filled with data, and a latch pulse is emitted to each IC from IC1 pin 118 (THLAT).With this latch pulse, all the contents of the shift registers are latched to the latch registers. Thereafter, through the addition of strobes from the IC1 pins (105 - 107) only black dot locations (=1) among latched data activates the driver, and the current passes to heat the emitting body causing heat emission. / Here, the three line strobes, STB1 to STB3, impress at intervals of 9.216 msec, as required for one-line printout. / The sequence is shown on the next page. [Moreover, for the strobe width, the thermistor value inside the thermal head is detected according to IC1 pin 2. (See BLOCK DIAGRAM ().) Depending on that value, the strobe width is recorded in ROM (IC2). / Accordingly, the strobe width is determined. / When the thermal head is not used, the IC1 (125, THON) becomes low, Q9 turns OFF, Q12 turns OFF, and the + 24 V power supply for the thermal head driver is not impressed to protect the IC.



7.4.4. SCANNING BLOCK

The scanning block of this device consists of a control circuit and a contact image sensor made up of a celfoc lens array, an LED array, and photoelectric conversion elements.

Circuit Diagram



When an original is inserted and the start button pressed, pin 16 of IC1 goes to a high level and the transistor Q8 turns on. This applies voltage to the LED array to light it. The contact image

sensor is driven by each of the FTG-F1 signals output from IC1, and the original image illuminated by the LED array undergoes photoelectric conversion to output an analog image signal. The analog image signal is input to the system LSI (IC1) on AIN1 (pin 1 of IC1) and converted into 8-bit data by the A/D converter inside IC1. Then this signal undergoes digital processing in order to obtain a high-quality image.

7.4.5. STEPPING MOTOR DRIVE CIRCUIT

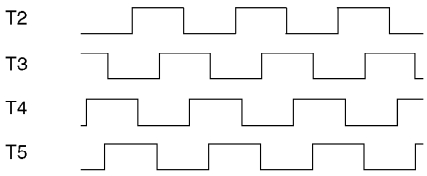
1. Function

One individual stepping motor is used for transmission and reception. It feeds the document or recording paper synchronized for reading or printing.

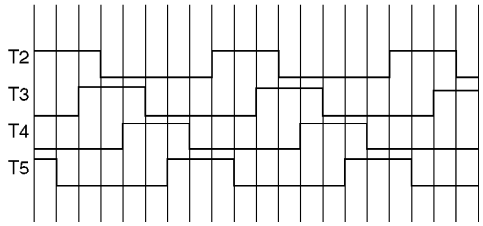
2. Circuit Operation

During motor drive, gate array IC1 pin 124 becomes a high level, and Q11 and Q10 go ON as a result. +24 V is supplied to the motor coil. / Stepping pulses are output from gate array IC1, causing driver IC8 to go ON. The motor coil is energized sequentially in 2 phase increments or 1-2 phase increments, which causes a 1-step rotation. A 1-step rotation is 0.13mm of recording paper or document paper. The timing chart is below.

Timing chart (2 Phase)



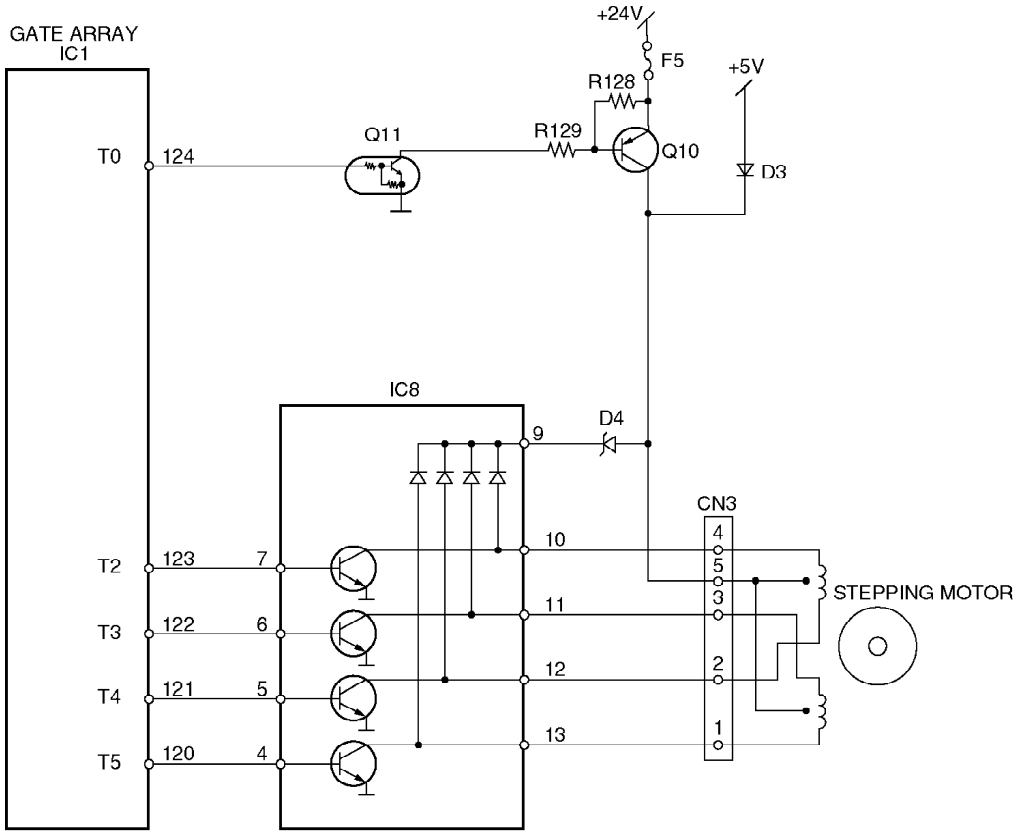
1-2. Phase (Asic T2-T5, output)



Stepping Motor Phase Pattern

Function	Mode	Phase Pattern	Speed
Copy	Fine/Half Tone	1-2	432 pps
	Super Fine	1-2	216 pps
FAX	STD	2	432 pps
	Fine/Half Tone	1-2	432 pps
	Super Fine	1-2	216 pps
———	Paper Feed	2	432 pps

Circuit Diagram



When the motor is OFF, gate array IC1 pin 124 becomes a low level and Q11 and Q10 also turns OFF. Instead of +24V, +5V is supplied through D3 so that the motor is held in place.

7.4.6. GEAR SECTION

This section shows how the motor-driven gear mechanism works in the main operations: FAX transmission, FAX reception the motor and copying.

7.4.6.1. MODE SELECTION

When the motor attached to the Drive Motor Gear rotates counterclockwise (CCW), Swing Gear A-2 engages the CAM and the CAM turns counterclockwise to select a mode. (See Fig. A.) There are three mode options controlled by the Switch: A: Transmit mode, B: Receive mode and C: Copy mode. In Fig. B, you can see which mode is selected by the position of the rib in the CAM.

7.4.6.2. MODE OPERATION

Once a mode is selected, the Drive Motor Gear rotates clockwise (CW) and then the Swing Gear A-1 controls the mode operation.

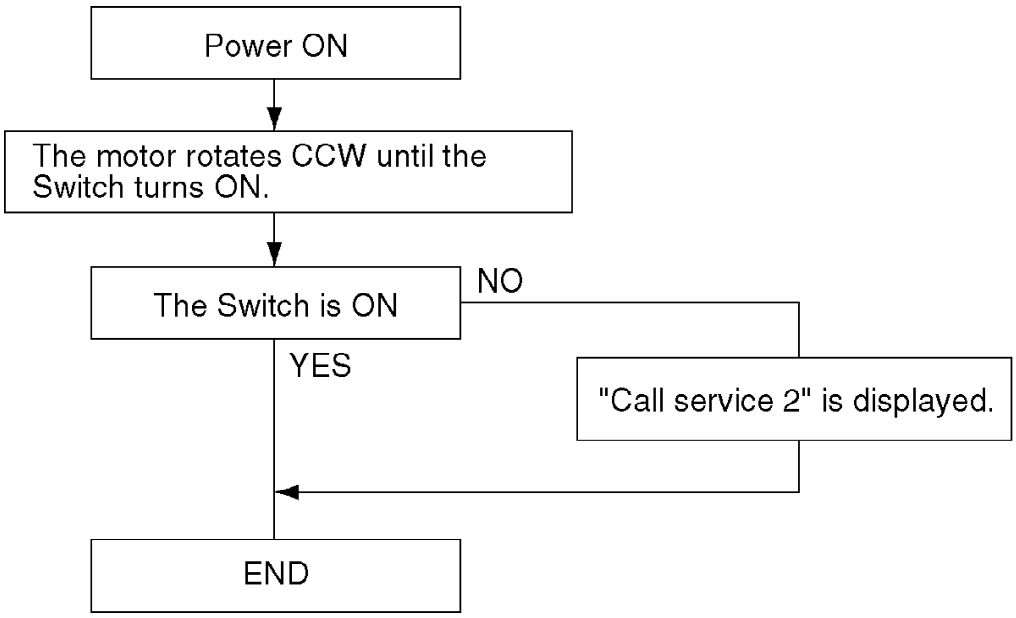
A: Transmit mode
Swing Gear A-1 engages G6 and conveys its drive power to the Separation Roller Gear for pre-feeding documents.

B: Receive mode
Swing Gear B engages G8 and conveys its drive power to the Platen Roller Gear for printing the received data.

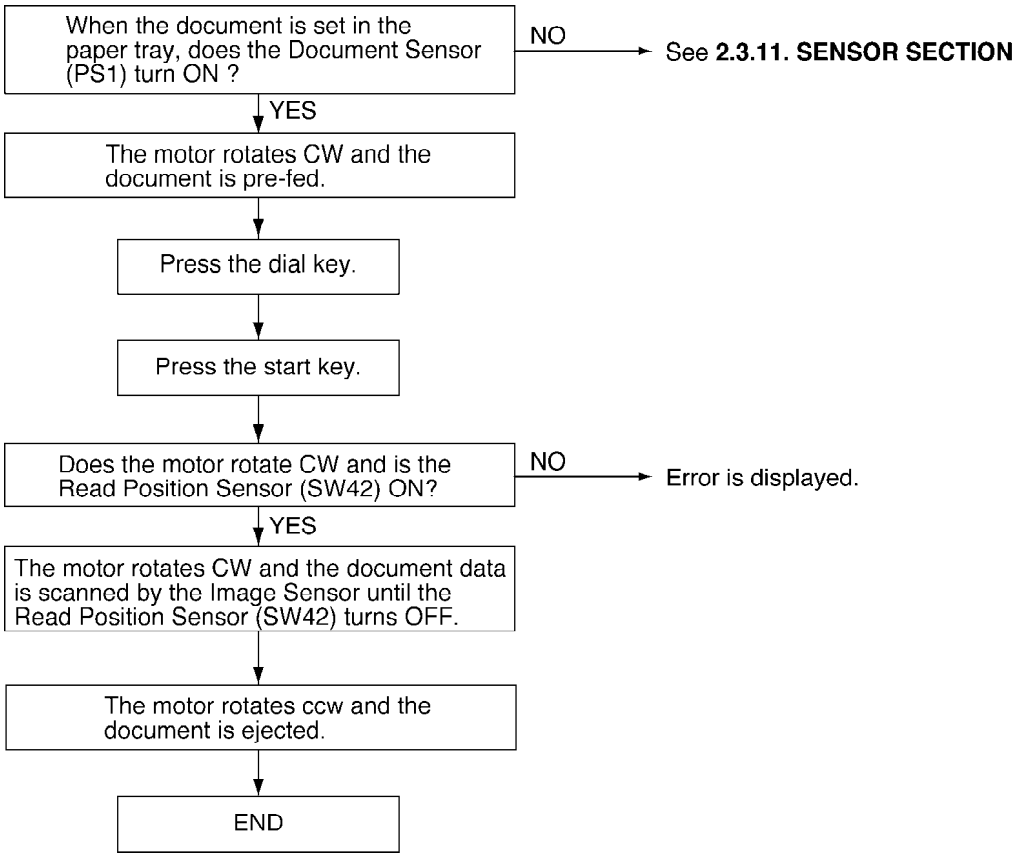
C: Copy mode
Swing Gear A-1 and B engage Gears 6 and 8 respectively and drive both the Separation Roller Gear and the Platen Roller Gear for feeding documents and recording paper in the copying operation.

7.4.6.3. MECHANICAL MOVEMENTS IN THE MAIN OPERATIONS

7.4.6.3.1. IDLE STATUS

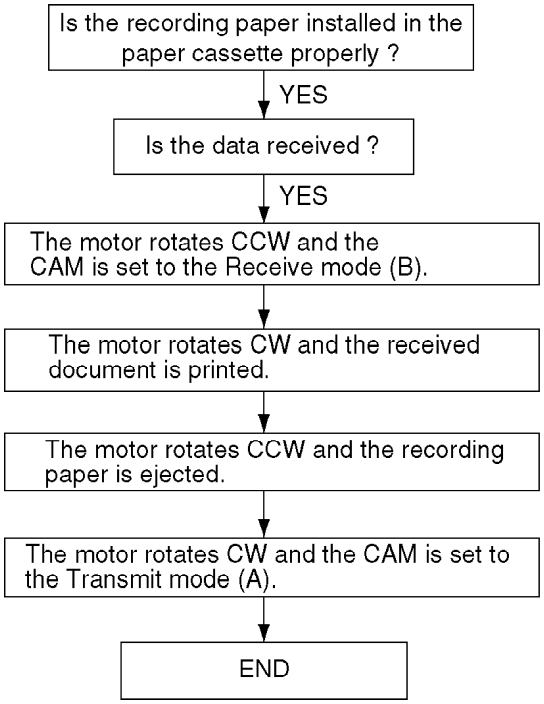


7.4.6.3.2. SCANNING



CROSS REFERENCE:
SENSOR SECTION ()

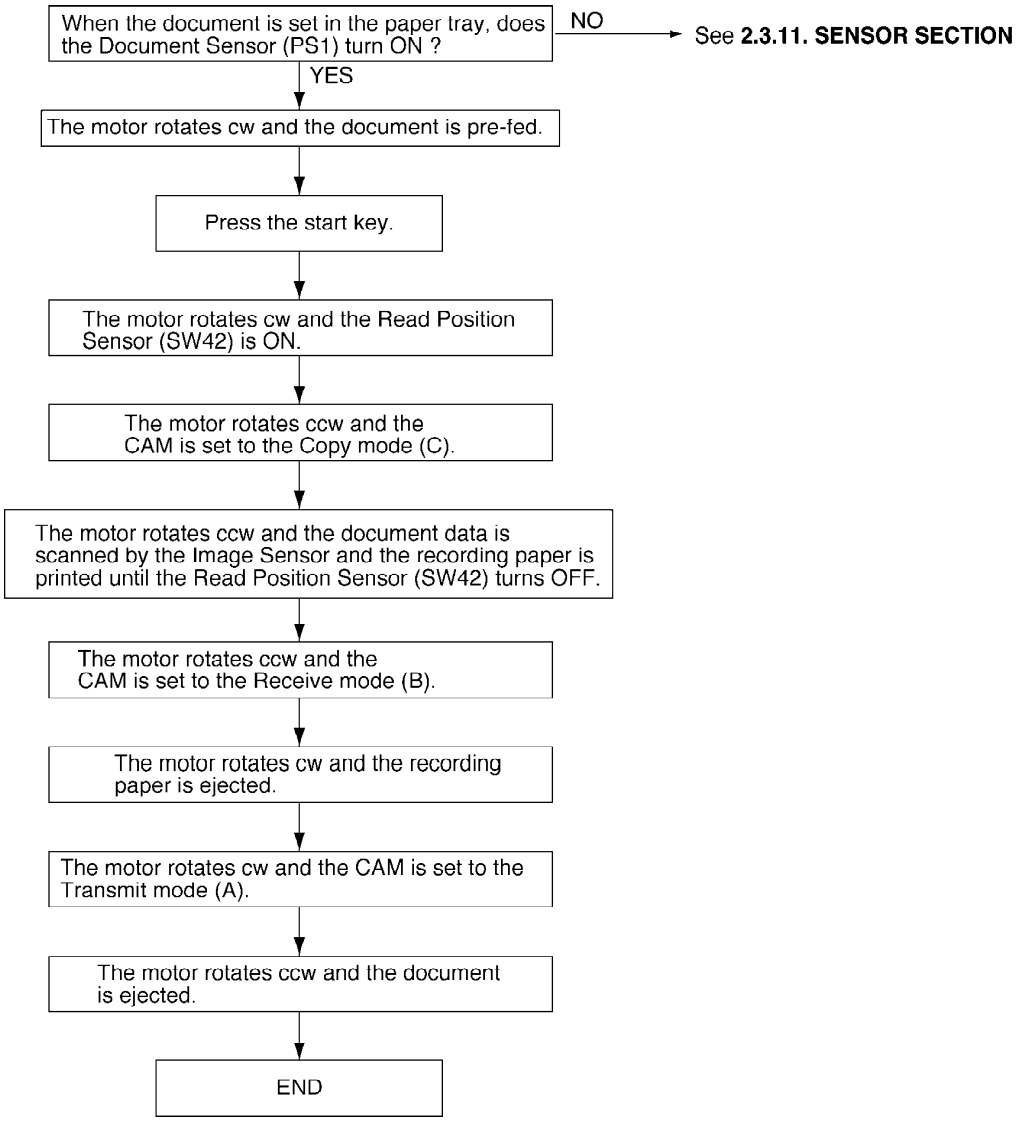
7.4.6.3.3. PRINTING



Note:

See 6.5. SENSERS AND SWITCHES.

7.4.6.3.4. COPYING



CROSS REFERENCE:

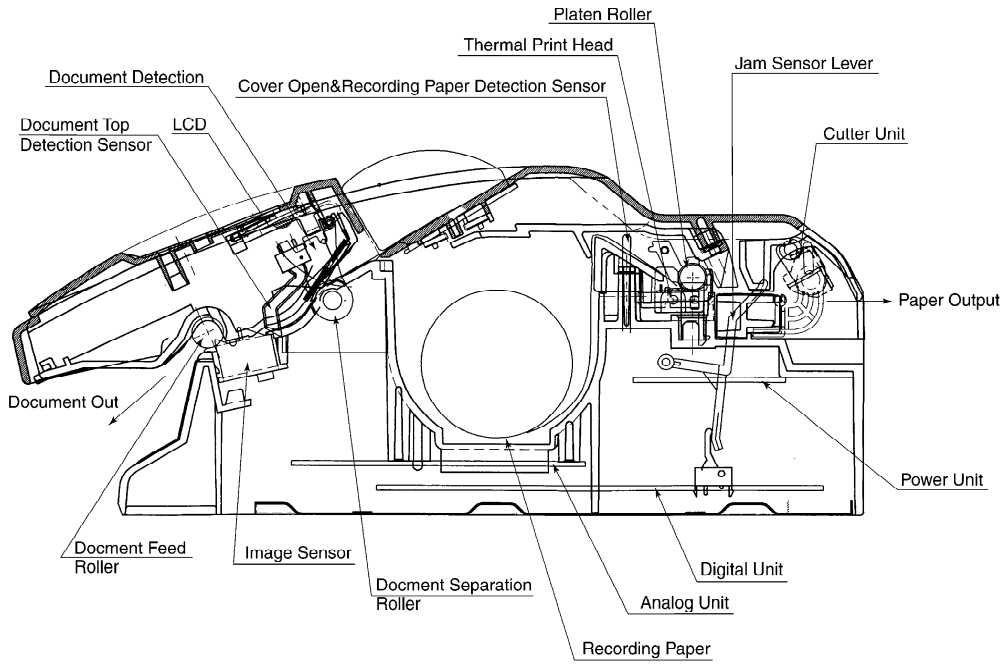
SENSOR SECTION ()

7.5. SENSORS AND SWITCHES

All of the sensor and switches are shown below.

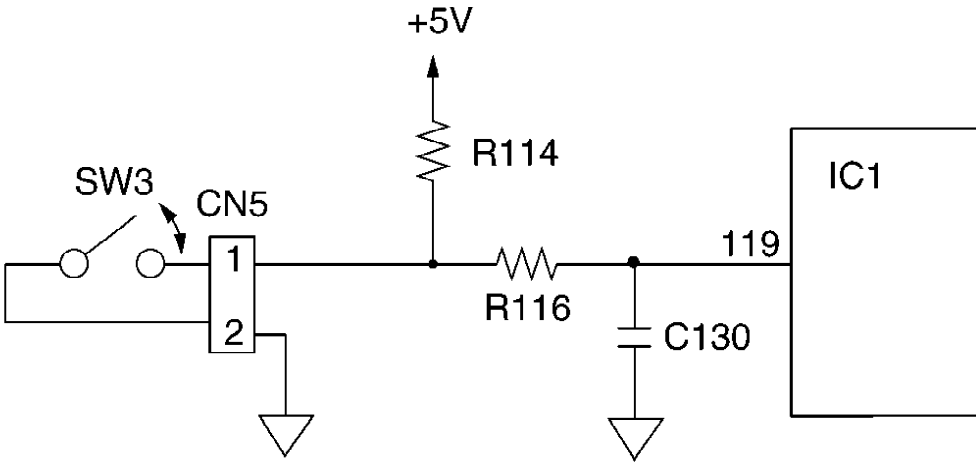
Sensor Circuit Location	Sensor	Sensor or Switch Name	Message Error
DIGITAL	SW3	Motor Position	[CALL SERVICE 2] (LLAME SERVICIO 2)
Analog	SW1	Cover Open and Paper set	[CHECK COVER] and [OUT OF PAPER] (REVISAR LA TAPA) and (SIN PAPEL)
	SW2	Hook SW	————
Operation Panel	SW42	Document Read Position	[REMOVE DOCUMENT] (REMOVER DOC)
	PS1	Document set	[CHECK DOCUMENT] (REVISAR DOC)
	SW41	JOG Sensor	————
ANALOG	SW3	JAM set	[PAPER JAMED] (PAPEL ATAS CADO)

Sensor Locations



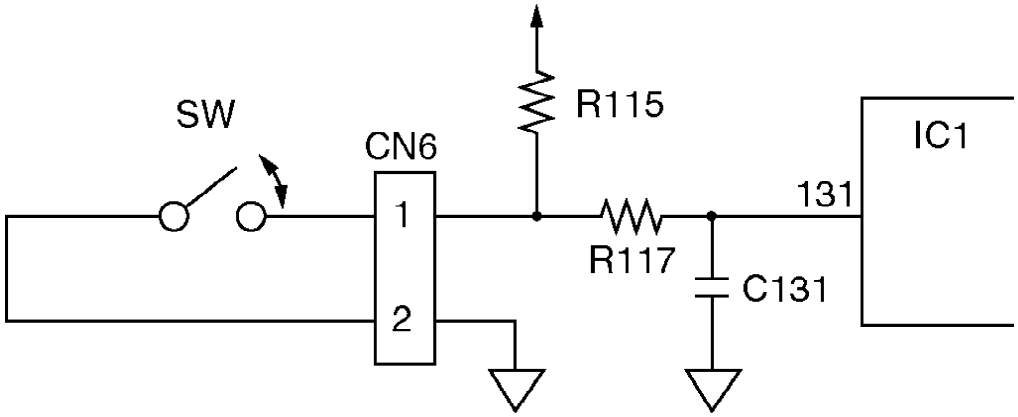
7.5.1. MOTOR POSITION SENSOR

This sensor is a detection switch for recording the position of the CAM.



Digital Board	
	Signal (IC1-119 Pin)
Home position	Low level
Other	High level

7.5.2. CUTTER POSITION SENSOR

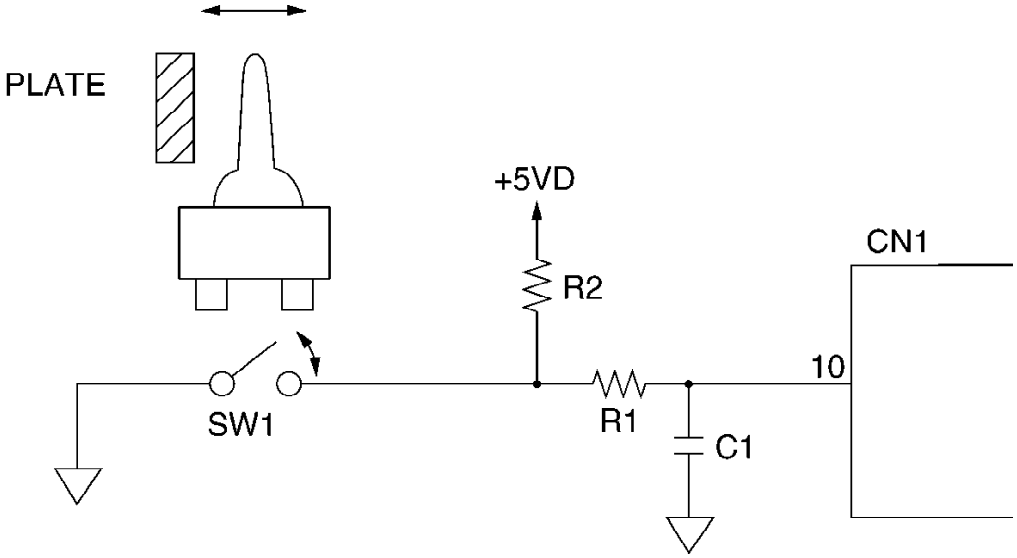


Digital Board	
	Signal (IC1-131 Pin)
Home position	Low level
Other	High level

7.5.3. RECORDING PAPER SENSOR (SW1)

When there is no recording paper, the plate is separated from the switch lever and the switch turns off. Pin 10 of CN1 (Analog board) becomes a high level. When there is recording paper, the plate pushes the switch lever and the switch turns ON. Pin 10 of CN1 (Analog board)

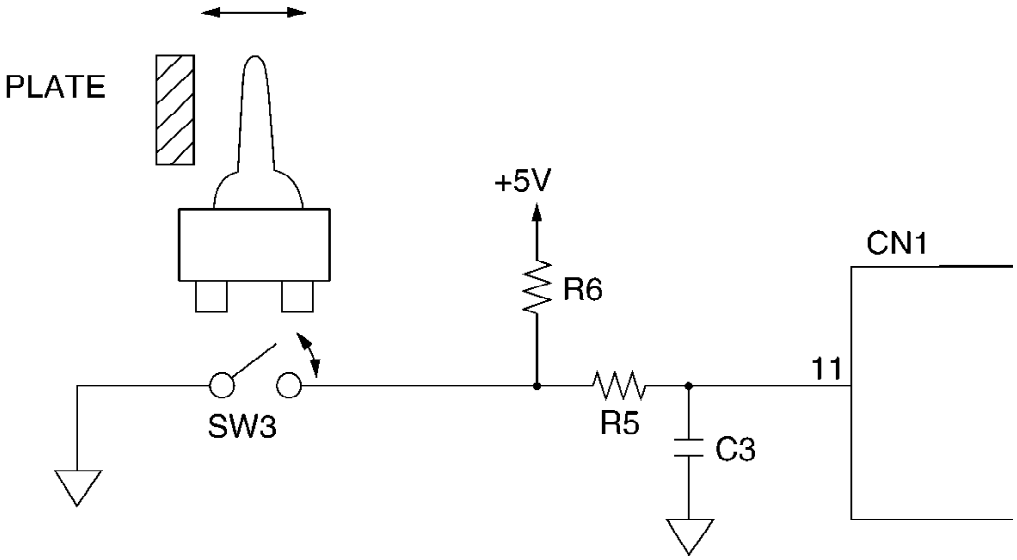
becomes a low level.



Analog Board	
	Signal (CN1-10 Pin)
Paper	Low level
No paper	High level

7.5.4. JAM SENSOR (SW3)

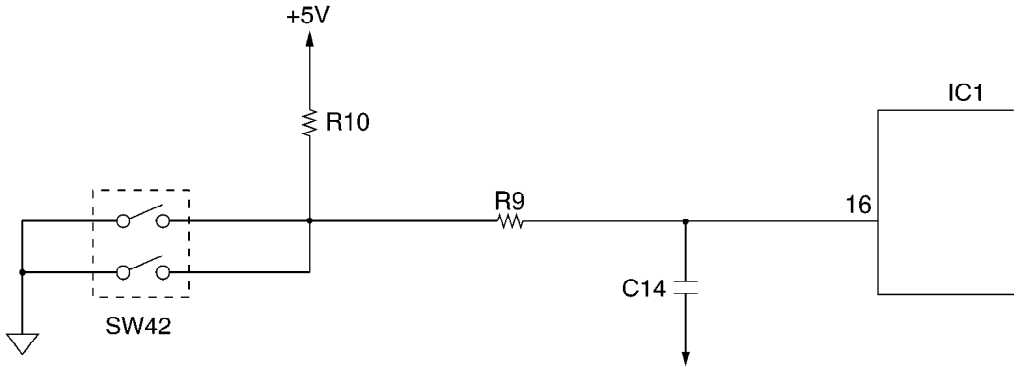
The JAM sensor is a detection switch for determining whether the recording paper edge is in the correct position or not. If the recording paper cannot be detected correctly at the JAM sensor position even when recording paper is present, then JAM is displayed. If the recording paper is at the sensor position, then the switch turns on the CN1-11pin (Analog) switches to a high level.



Analog Board	
	Signal (CN1-11 Pin)
Paper	Low level
No paper	High level

7.5.5. DOCUMENT TOP SW (SW42)

When a document is brought to the read position, the SW becomes ON, and the input signal of IC1-16 pin (Operation) becomes a low level. When there is no document at the read position, the SW becomes OFF, and the input signal of IC1-16 pin (Operation) becomes a high level.

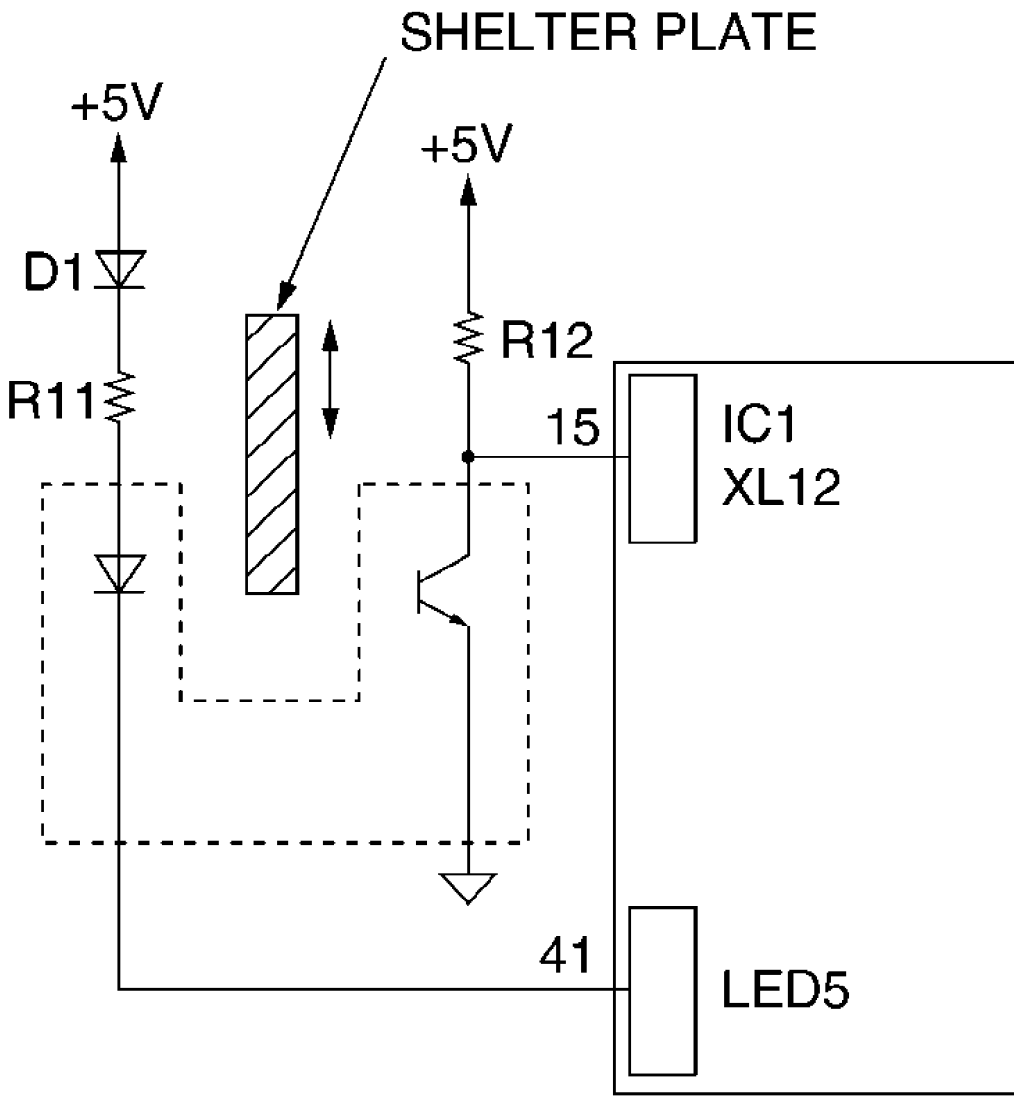


Operation Board

	Signal (IC1-16 pin)
Out of the Read Position	High level
At the Read Position	Low level

7.5.6. DOCUMENT SET SENSOR (PS1)

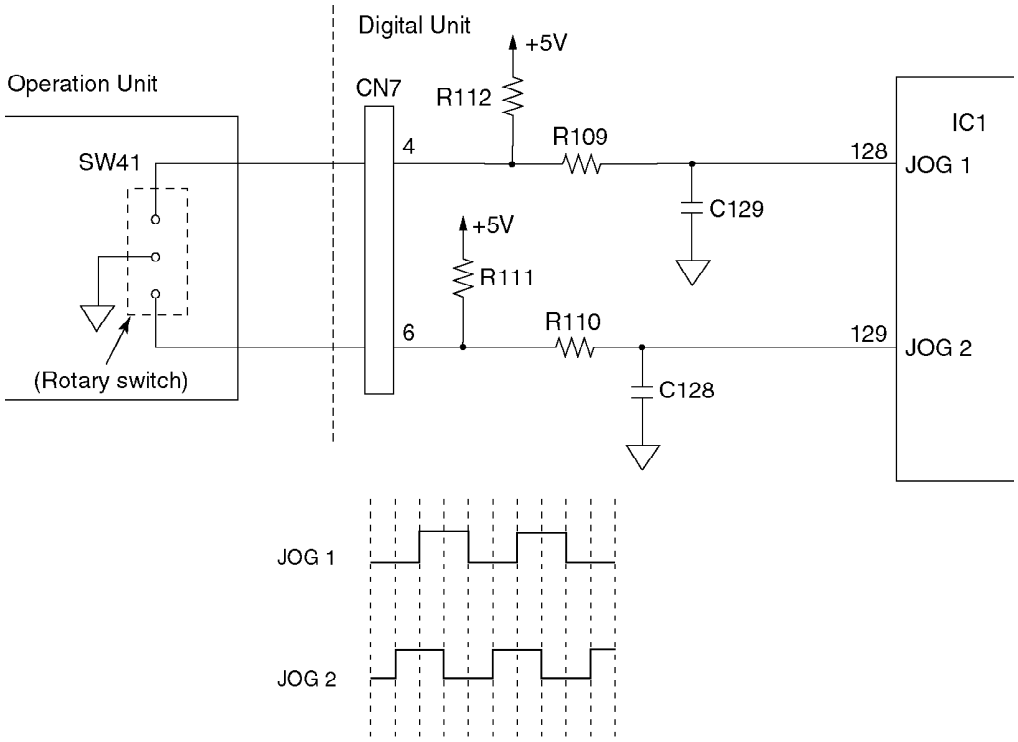
When a document is set, the shelter plate closes the sensor light, the photo transistor becomes OFF, and the input signal of the IC1-15 pin (Operation) becomes a high level. When there is no document, the shelter plate passes the sensor light, the photo transistor becomes ON, and the input signal of the IC1-15 pin (Operation) becomes a low level. (When checking this sensor, the IC1-41 pin becomes a low level.)



Operation Board		
	Photo transistor	Signal (IC1-15 Pin)
No document	ON	Low level
Set document	OFF	High level

7.5.7. JOG SENSOR (SW 41)

This sensor detects the speed and direction of the jog dial rotation based on variations in the potential of JOG1 (pin 128 of IC1) and JOG2 (pin 129 of IC1).



Variations in Potential During Jog Dial Rotation

7.6. MODEM SECTION

7.6.1. FUNCTION

The unit uses a 1 chip modem (IC5), enabling it to act as an interface between the control section for FAX sending and receiving, and the telephone line. During a sending operation, the digital image signals are modulated and sent to the telephone line. During a receiving operation, the analog image signals which are received via the telephone line are demodulated and converted into digital image signals. The communication format and procedures for FAX communication are standardized by ITU-T. This 1 chip modem (IC5) has hardware which sends and detects all of the necessary signals for FAX communication and DTMF. / It can be controlled by writing commands from the ASIC (IC1) to the register in the modem (IC5). / This modem (IC5) also sends DTMF signals, and detects busy tones, dial tones and DTMF.
Overview of Facsimile Communication Procedures (ITU-T Recommendation):

1. ON ITU-T (International Telecommunications' Union.)
The No. XIV Group of ITU-T, one of the four permanent organizations of the International Telecommunications Uniib (ITU), investigates and make recommendations on international standards for facsimiles.

2. Definition of Each Group

- Group I (G1)

A-4 size documents without using formats which reduce the band width of a signal sent over telephone lines. / Determined in 1968. / Transmission for about 6 minutes at scanning line density of 3.85 lines/mm.

- Group II (G2)

Using reduction technology in the modulation/demodulation format, an A-4 size document is sent at an official scanning line density of 3.85 lines/mm for about 3 minutes. / Methods to suppress redundancy are not used. / Determined in 1976.

- Group III (G3)

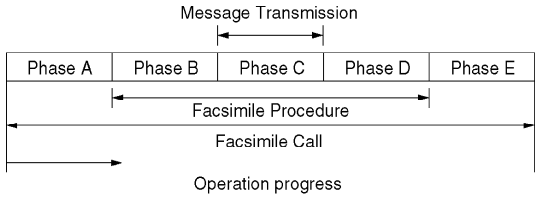
A method of suppressing redundancy in the image signal prior to modulation is used. An A-4 size document is sent with about one minute. / Determined in 1980.

- Group IV (G4)

Transmission is via the data network. A method is provided for suppressing redundancy in signals prior to transmission, and error-free reception of transmission is possible. / The scope of these facsimile applications is not limited simply to transmission of written statements. Through symbiotic linkages with other communication methods, it can be expected to expand to include integrated services.

3. Facsimile Call Time Series

As shown in the following diagram, the facsimile call time series is divided into five phases.



Phase A : Call setting

Call setting can be manual/automatic.

Phase B : Pre-message procedure

Phase B is a pre-processing procedure and sequence for confirming the status of the terminal, transmission route, etc. and for terminal control. It implements the terminal preparation status, determines and displays terminal constants, confirms synchronization status, etc. and prepares for transmission of facsimile messages.

Phase C : Message transmission

Phase C is the procedure for transmitting facsimile messages.

Phase D : Post message procedure
Phase D is the procedure for confirming that the message is completed and received. For continuous transmission, phase B or phase C are repeated for transmission.
Phase E : Call retrieval
Phase E is the procedure for call retrieval, that is for circuit disconnection.

4. Concerning Transmission Time
[Transmission Time] = [Control Time] + [Image Transmission Time] + [Hold Time]
Transmission time consists of the following.

Control time:
This is time at the start of transmission when the functions at the sending and receiving sides are confirmed, the transmission mode is established, and transmission and reception are synchronized.

Image transmission time:
This is the time required for the transmission of document contents (image data). In general, this time is recorded in the catalog, etc.

Hold time:
This is the time required after the document contents have been sent to confirm that the document was in fact sent, and to check for telephone reservations and/or the existence of continuous transmission.

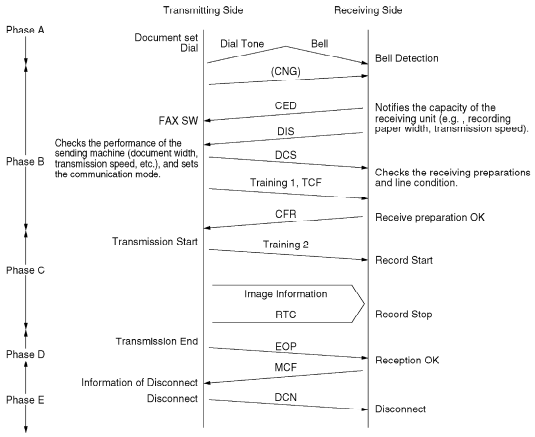
5. Facsimile Standards

Item	Telephone Network Facsimile G3 Machine
Connection Control Mode	Telephone Network Signal Mode
Terminal Control Mode	T. 30 Binary
Facsimile Signal Format	Digital
Modulation Mode	PSK (V. 27 ter) or QAM (V. 29)
Transmission Speed	300 bps (Control Signal) 2400, 4800, 7200, 9600 bps (FAX Signal)
Redundancy Compression Process (Coding Mode)	1 dimension: MH Mode 2 dimension: MR Mode (K=2.4)
Resolution	Main Scan: 8 pel/mm Sub Scan: 3.85, 7.7l/mm
Line Synchronization Signal	EOL Signal
1 Line Transmission Time [ms/line]	Depends on the degree of data reduction. Minimum Value: 10, 20 Can be recognized in 40ms.

6. Explanation of Technology

a. G3 Communication Signals (T. 30 Binary Process)

For G3 facsimile communication, this is the procedure for exchanging control signals between the sending and receiving machines both before and after transmission of image signals. / Control signals at 300 bps FSK are: 1850 Hz...0, 1650Hz...1. / An example of the binary process in G3 communication is shown below.



Explanation of Signals

Control signals are comprised mainly of 8-bit identification signals and of the data signals added to them. Data signals are added to DIS and DCS signals.

Signal.....DIS (Digital Identification Signal) / Identification Signal Format.....00000001

Function: / Notifies the capacity of the receiving unit. The added data signals are as follows.

(Example)

Bit No.	DIS/DTC	DCS
1	Transmitter - T.2 operation	
2	Receiver - T.2 operation	Receiver - T.2 operation
3	T.2 IOC = 176	T.2 IOC = 176
4	Transmitter - T.3 operation	
5	Receiver - T.3 operation	Receiver - T.3 operation
6	Reserved for future T.3 operation features.	
7	Reserved for future T.3 operation features.	
8	Reserved for future T.3 operation features.	
9	Transmitter - T.4 operation	
10	Receiver - T.4 operation	Receiver - T.4 operation
11, 12 (0, 0) (0, 1) (1, 0) (1, 1)	Data signaling rate V.27 ter fall back mode V.27 ter V.29 V.27 ter and V.29	Data signaling rate 2400 bit/s, V.27 ter 4800 bit/s, V.27 ter 9600 bit/s, V.29 7200 bit/s, V.29
13	Reserved for the new modulation system.	
14	Reserved for the new modulation system.	
15	Vertical resolution = 7.7 line/mm	Vertical resolution = 7.7 line/mm
16	Two-dimensional coding capability	Two-dimensional coding

Bit No.	DIS/DTC	DCS
17, 18	Recording width capabilities	Recording width
(0, 0)	1728 picture elements along scan line length of	1728 picture elements along scan length of
(0, 1)	215 mm ± 1%	215 mm ± 1%
	1728 picture elements along scan line length of	2432 picture elements along scan length of
	215 mm ± 1% and	303 mm ± 1%
	2048 picture elements along scan line length of	
(1, 0)	255 mm ± 1% and	
	2432 picture elements along scan line length of	2048 picture elements along scan length of
	303 mm ± 1%	255 mm ± 1%
(1, 1)	1728 picture elements along scan line length of	
	215 mm ± 1% and	
	2048 picture elements along scan line length of	Invalid
	255 mm ± 1%	
	Invalid	
19, 20	Maximum recording length capability	Maximum recording length
(0, 0)	A4 (297 mm)	A4 (297 mm)
(0, 1)	Unlimited	Unlimited
(1, 0)	A4 (297 mm) and B4 (364 mm)	B4 (364 mm)
(1, 1)	Invalid	Invalid

Signal.....DCS (Digital Command Signal) / Identification Signal Format.....X1000001
Function: / Notifies the capacity of the receiving machine obtained at DIS and announces the transmission mode of the sender. The added data signals are as follows.

(Example)

Bit No.	DIS/DTC	Standard setting	DCS
21, 22, 23 (0, 0, 0) (0, 0, 1) (0, 1, 0) (1, 0, 0) (0, 1, 1) (1, 1, 0) (1, 0, 1) (1, 1, 1)	Minimum scan line time capability of the receiver 20 ms at 3.85 l/mm: T7.7 = T3.85 40 ms at 3.85 l/mm: T7.7 = T3.85 10 ms at 3.85 l/mm: T7.7 = T3.85 5 ms at 3.85 l/mm: T7.7 = T3.85 10 ms at 3.85 l/mm: T7.7 = 1/2 T3.85 20 ms at 3.85 l/mm: T7.7 = 1/2 T3.85 40 ms at 3.85 l/mm: T7.7 = 1/2 T3.85 0 ms at 3.85 l/mm: T7.7 = T3.85		Minimum scan line time 20 ms 40 ms 10 ms 5 ms 0 ms
24	Extend field	1	Extend field
25	2400 bit/s handshaking	0	2400 bit/s handshaking
26	Uncompressed mode	0	Uncompressed mode
27	Error correction mode	0	Error correction mode
28	Set to "0".	0	Frame size 0 = 256 octets 1 = octets
29	Error limiting mode	0	Error limiting mode
30	Reserved for G4 capability on PSTN	0	Reserved for G4 capability o
31	Unassigned	0	
32	Extend field	1	Extend field
33 (0) (1)	Validity of bits 17, 18 Bits 17, 18 are valid Bits 17, 18 are invalid	0	Recording width Recording width indicated b 18 Recording width indicated b field bit / information
34	Recording width capability 1216 picture elements along scan line length of 151 ± mm 1%	0	Middle 1216 elements of 172 elements
35	Recording width capability 864 picture elements along scan line length of 107 ± mm 1%	0	Middle 864 elements of 1728 elements
36	Recording width capability 1728 picture elements along scan line length of 151 ± mm 1%	0	Invalid
37	Recording width capability 1728 picture elements along scan line length of 107 ± mm 1%	0	Invalid
38	Reserved for future recording width capabilities.	0	
39	Reserved for future recording width capabilities.	0	
40	Extend field	1	Extend field
41	Semi super time / mm	1	
42	Semi super time / mm	0	
43	Super time	0	

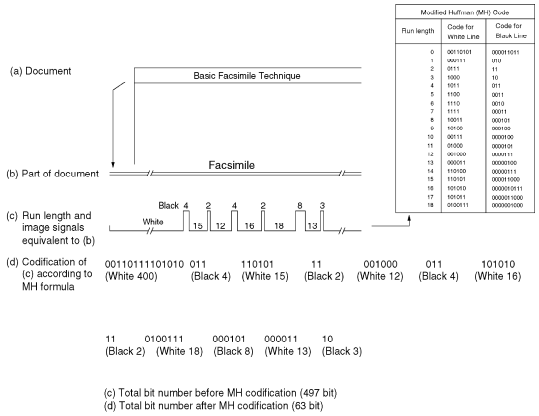
Bit No.	DIS/DTC	Standard setting	DCS
44	Inch	0	
45	mm	1	
46	MSC/SF	0	
47	Select Polling	0	
48	EXT	0	

Note 1 - Standard facsimile units conforming to T.2 must have the following capability: Index of cooperation (IOC)=264.
Note 2 - Standard facsimile units conforming to T.3 must have the following capability: Index of cooperation (IOC)=264.
Note 3 - Standard facsimile units conforming to T.4 must have the following capability: Paper length=297 mm.

Signal	Identification Signal Format	Function
Training 1	————————	A fixed pattern is transmitted to the receiving at a speed (2400 to 9600 bps) designated by and the receiving side optimizes the automat equalizer, etc., according to this signal.
TCF (Training Check)	————————	Sends 0 continuously for 1.5 seconds at the speed as the training signal.
CFR (Confirmation to Receive)	X0100001	Notifies the sending side that TCF has been properly received. If TCF is not properly rece FTT (Failure To Train) X0100010 is relayed to sender. The sender then reduces the transmission speed by one stage and initiate training once again.
Training 2	————————	Used for reconfirming the receiving side like training 1.
Image Signal	Refer to the next page.	————————
RTC (Return to Control)	————————	Sends 12 bits (0...01 × 6 times) to the receive the same speed as the image signal and noti completion of transmission of the first sheet
EOP (End of Procedure)	X1110100	End of one communication
MCF (Message Confirmation)	X0110001	End of 1 page reception
DCN (Disconnect)	X1011111	Phase E starts.
MPS (Multi-Page Signal)	X1110010	Completion of transmission of 1 page. If ther still more documents to be sent, they are out instead of EOP. After MCF reception, the sen transmits an image signal of the second she
PRI-EOP (Procedural Interrupt-EOP)	X1111100	If there is an operator call from the sender, it output after RTC.

Signal	Identification Signal Format	Function
PIP (Procedural Interrupt Positive)	X0110101	This is output when an operator call is receiv

b. Redundancy Compression Process Coding Mode / This unit uses one-dimensional MH format.



7.6.2. MODEM CIRCUIT OPERATION

The modem (IC5) has all the hardware satisfying the ITU-T standards mentioned previously. When the ASIC IC1 (61) is brought to a low level, the modem (IC5) is chip-selected and the resistors inside IC are selected by the select signals from ASIC (IC1) ADR0-ADR4. The commands are written through the data bus, and all the processing is controlled by the ASIC (IC1) according to ITU-T procedures. The INT signal dispatched from IRQ1, 2 (pins 108 and 121 of IC5) to ASIC (IC1) when the transmission data is accepted and the received data is demodulated, the ASIC (IC1) implements post processing. This modem (IC5) has an automatic application equalizer.

With training signal 1 or 2 during G3 reception, it can automatically establish the optimum equalizer. The modem (IC5) operates using the 32.256 MHz clock (X3).

1. Facsimile Transmission

The digital image data on the data bus is modulated in the modem (IC5), and sent from pin 69 via analog SW (IC9) and amplifier IC10 and the NCU section to the telephone line.

Refer to CHECK SHEET ()

2. Facsimile Reception

The analog image data which is received from the telephone line passes through the NCU section and enters pin 60 of the modem (IC5). The signals that enter pin 60 of the modem (IC5) are demodulated in the board to digital image signals, then placed on the data bus.

In this case, the image signals from the telephone line are transmitted serially. Hence, they are placed on the bus in 8 bit units. Here, the internal equalizer circuit reduces the image signals to a long-distance receiving level.

This is designed to correct the characteristics of the frequency band centered about 3 kHz and maintain a constant receiving sensitivity. It can be set in the service mode.

Refer to CHECK SHEET ()

3. DTMF Transmission (Monitor tone)
   The DTMF signal generated in the modem (IC5) is output from pin 69, and is then sent to the circuit on the same route as used for facsimile transmission.
   Refer to CHECK SHEET ()
   (DTMF Monitor Tone)
   Refer to CHECK SHEET ()

4. Busy/Dial Tone Detection
   The path is the same as FAX receiving. When it is detected, the carrier detect bit of the resistor in the modem (IC5) becomes 1, and this status is monitored by the ASIC (IC1).

7.7. ANALOG UNIT BLOCK DIAGRAM

7.8. NCU SECTION

7.8.1. GENERAL

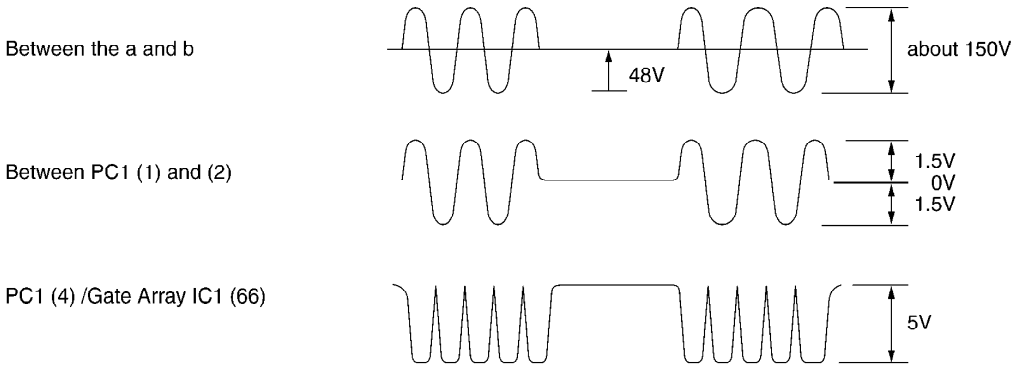
This section is the interface between the telephone line. It is composed of bell detection circuit, pulse dialing circuit, CPC detection circuit, line amplifier, sidetone circuits and Remote FAX activation circuit.

7.8.2. LINE RELAY (RLY1)

1. Circuit Operation
   Normally, this relay switches to the external telephone side (Break) and switches to the open side (make) when the unit starts facsimile communication.
   [IC1 (130) High Level → CN2 (9)] → CN1 (9) → Q3 ON → RLY1 (make)

7.8.3. BELL DETECTION CIRCUIT

1. Circuit Operation
   The signal waveform for each section is indicated below. The signal (low level section) input to pin 66 of ASIC IC1 on the digital board is read.



TEL LINE → PC1 (1, 2 - 4) → CN1(6) → [CN2(6) → IC1(66)]

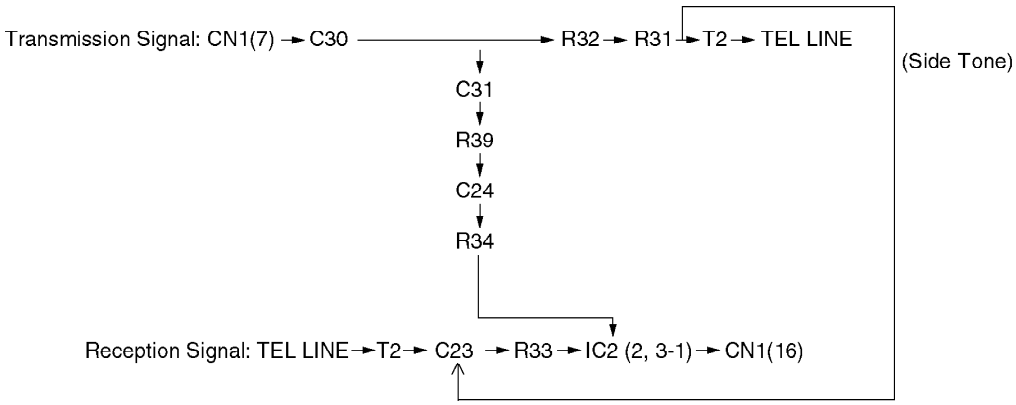
7.8.4. PULSE DIALIG

[IC1 (130) High Level → CN2 (9)] → CN1 (9) → Q3 ON → RLY1 (make)

7.8.5. LINE AMPLIFIER AND SIDE TONE CIRCUITS

1. Circuit Operation

The reception signal received as output from line transformer T2 is given as input to C23, R33 and IC2(2). / Then it is input to the reception system at an amplifier gain of 3.3 dB from pin (2). / The transmission signal is input from CN1 pin (7), and output to the TEL line through C30, R32, R31 and T2. Without a side tone circuit, the transmission signal would return to the reception amplifier via C30 and R31. Here, the signal output from CN1 pin (7) passes through C30, C31 and R39, and enters the amplifier IC2 pin (3). This is used to cancel the return portion of the transmission signal. This is the side tone circuit.



7.8.6. CPC (CALLING PARTY CONTROL) DETECTION CIRCUIT

1. Function

This circuit detects the signal (cuts the current) output from the converter when the other party finishes ICM recording
and goes into the ON-HOOK status.
TAD detects this signal and disconnects the line. When the TAD is operating, pin (4) of PC2

becomes a low level.
While detecting the CPC signal, pin (4) of PC2 becomes a high level. When the CPC signal is detected, the TAD operation
stops and the line is disconnected.

7.9. ITS (INTEGRATED TELEPHONE SYSTEM) AND MONITOR SECTION

7.9.1. GENERAL

The general ITS operation is performed by the modem IC5. The alarm tone, the key tone, the calling tone and the beep are output from the ASIC IC1 (digital board).

7.9.2. SPEAKER PHONE CIRCUIT

1. Function

The circuit controls the automatic switching of the transmitted and received signals, to and from the telephone line, when the unit is used in the hands-free mode.

2. Circuit Operation

The speakerphone can only provide duplex.

3. Signal path

Refer to CHECK SHEET ()

7.9.3. HANDSET CIRCUIT

1. Function

This circuit controls the conversation over the handset, i.e. the transmitted and received voices to and from the handset.

2. Signal path

Refer to CHECK SHEET ()

7.9.4. MONITOR CIRCUIT FOR EACH SIGNALS

1. Function

This circuit monitors various tones, such as 1 DTMF tone, 2 Alarm /Beep/Key tone/Bell 3 Dummy ring back tone.

2. Signal path

Refer to CHECK SHEET () / /

7.10. ATAS (AUTOMATIC TELEPHONE ANSWERING SYSTEM) SECTION

1. Function

The ATAS main operation is performed by the special IC5

(MODEM). IC6 (FLASH MEMORY)'s control signals are input from ASIC IC1.

A. Greeting/Message Recording

B. ICM Recording

C. Greeting/Message/ICM play to speaker

D. Greeting/Message/ICM play to Tel Line

E. Vox Detection

2. Signal Path

Refer to CHECK SHEET () / /

7.10.1. REMOTE RECEIVING

1. Function

This is the parallel connection DTMF signal for the TEL mode between a and b. When the other party is a FAX, the unit changes to FAX receiving.

2. Signal Path

Refer to CHECK SHEET ()

7.10.2. CIRCUIT DIAGRAM

7.11. OPERATION BOARD SECTION

The unit consists of an LCD (Liquid crystal display), KEYs and LEDs (light-emitting diode). They are controlled by the Gate Array (IC1) and ASIC (IC1: on the DIGITAL BOARD). The key matrix table is shown below.

Key Matrix

I / O	KIN 0	KIN 1	KIN 2	KIN 3	KIN 4	KIN 5	KIN 6
KSL0	RECEIVE MODE (SW1)	0 (SW6)	FLASH (SW11)	* (SW15)	7 (SW18)	MUTE (SW23)	BROADCAST (SW28)
KSL1	MENU (SW2)	9 (SW7)	# (SW12)		ERASE (SW19)	REDIAL/ PAUSE (SW24)	(SW29)
KSL2	DIRECTORY PROGRAM (SW3)	(SW8)			COPY/START/ SET (SW20)	8 (SW25)	RECORD (SW30)
KSL3	HELP (SW4)	PLAY MESSAGES (SW9)	RESOLUTION (SW13)	SP-PHONE (SW16)	2 (SW21)	1 (SW26)	VOL ∨ (SW31)
KSL4	VOL ∧ (SW5)	6 (SW10)	STOP (SW14)	3 (SW17)	5 (SW22)	4 (SW27)	(SW32)

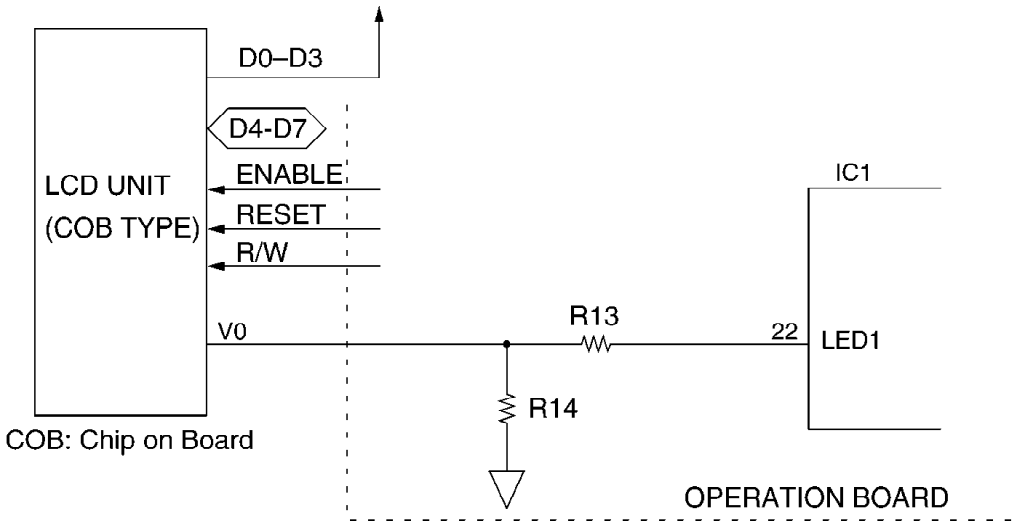
LED

	LED2
	LED1 PLAY MESSAGES

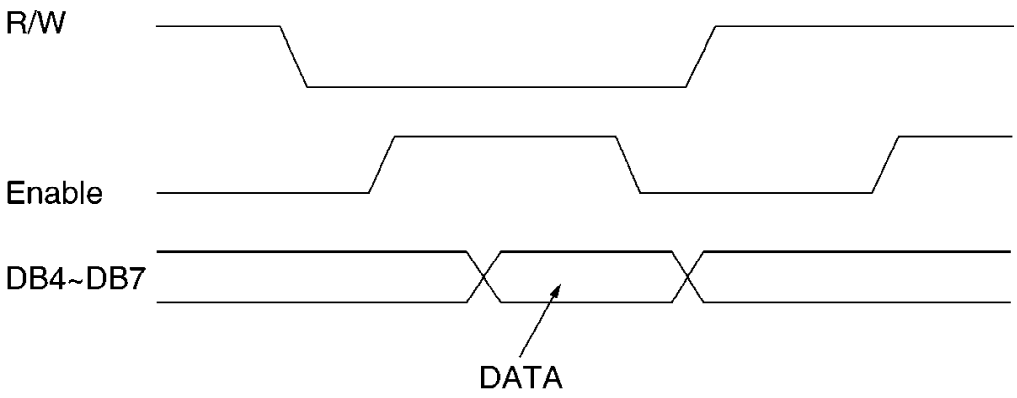
7.12. LCD SECTION

The Gate Array (IC1) works only for writing the ASCII code from data bus (D4-D7). V0 is supplied for the crystal drive. R13 and R14 are density control resistors. Consequently, in this unit, the timing (positive clock) is generated by the LCD interface circuitry in the gate array (IC1).

Circuit Diagram



Timing Chart

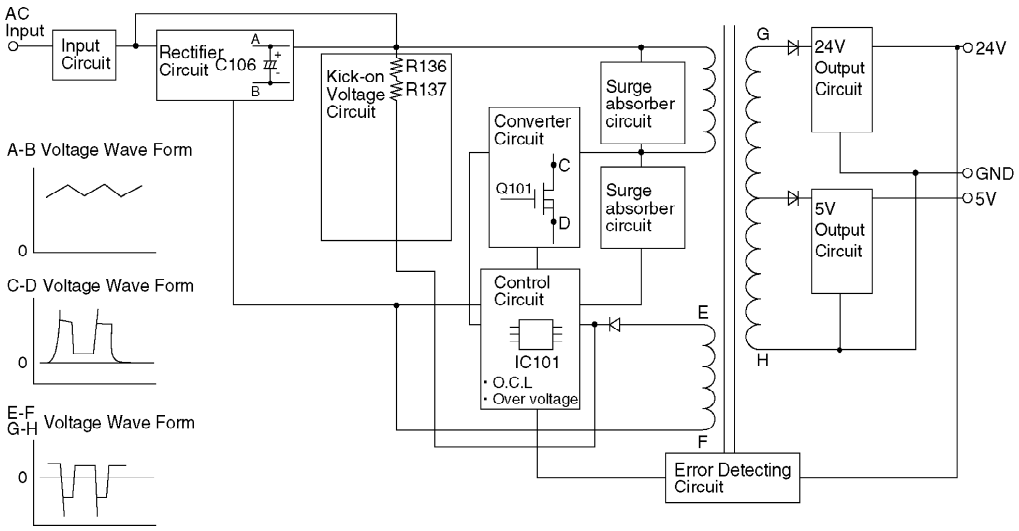


Density	Normal	Dark
LED1 (IC1-22pin)	H	L

7.13. POWER SUPPLY BOARD SECTION

This power supply board uses the switching regulator method.

Block Diagram



[Input Circuit]

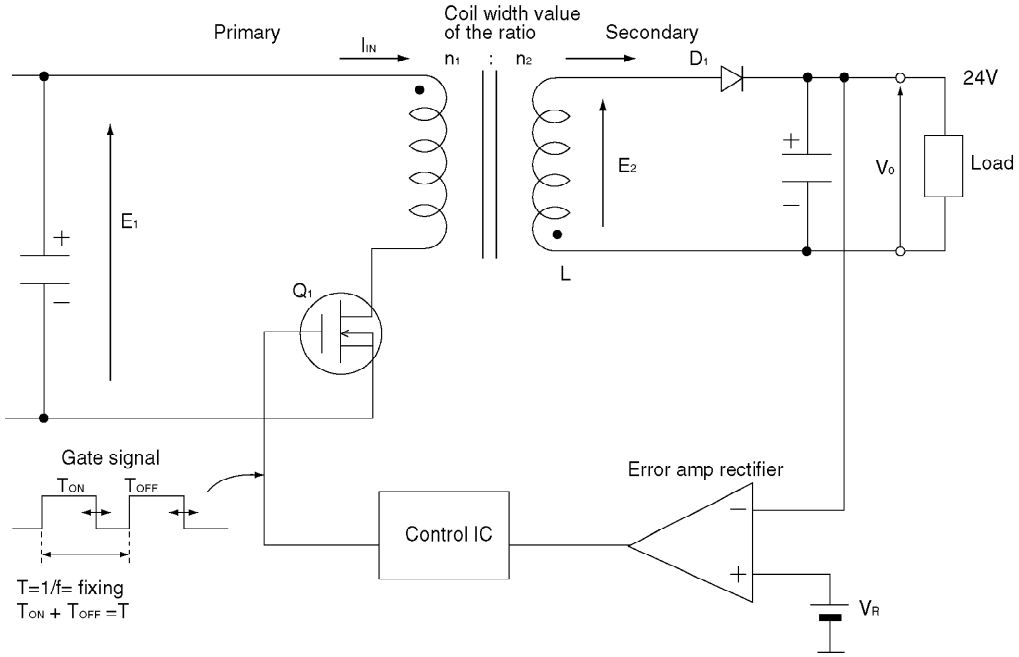
The input current goes into the input rectifier circuit through the filter circuit. The filter circuit decreases the noise voltage and the noise electric field strength.

[Rectifier Circuit]

The input current is rectified by D101,D102,D103 and D104 and charges C106 to make DC voltage. Then it supplies power to the converter circuit.

[Kick-on voltage circuit]

Bias is applied to the Q101 gate via this circuit when the AC power is turned on and Q101 begins operating.



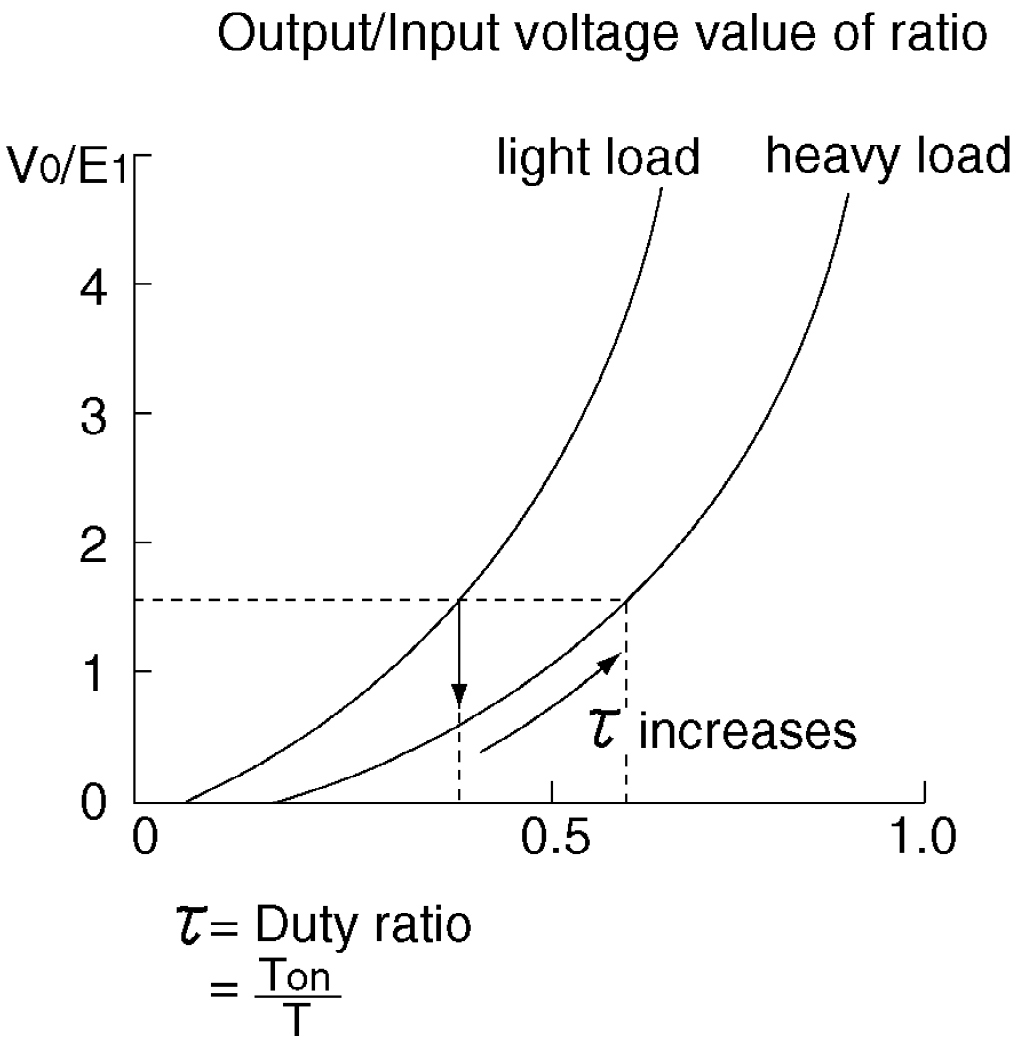
The following is an overview of how the power supply unit is controlled.

The control method of this power supply unit is pulse width modulation.

When Q_1 is ON, the energy is charged in the transfer primary coil according to E_1. When Q_1 is OFF, the energy is output from the secondary transfer as follows.

L → D_1 → Load → L

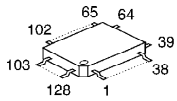
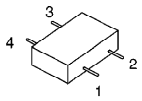
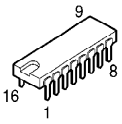
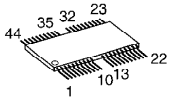
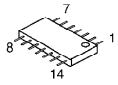
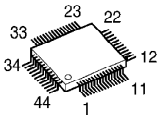
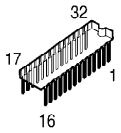
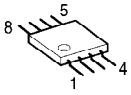
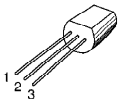
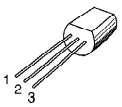
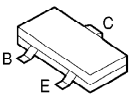
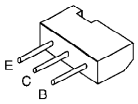
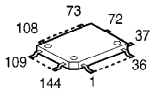
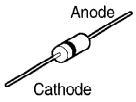
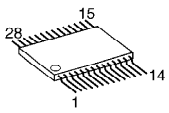
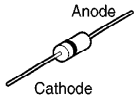
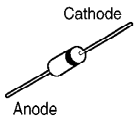
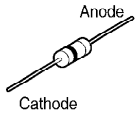
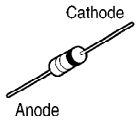
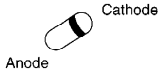
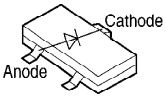
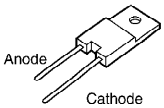
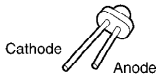
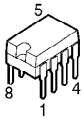
Then the power is supplied to the Load. When Q_1 is ON, power is not output from the secondary side. The output voltage is fed back in the control IC according to the error amp rectifier. Then depending on how TON is controlled, stabilization occurs. Also, when the current load becomes too large, in order to decrease the voltage output, the increase in τ is controlled and the output voltage is stabilized.
Therefore, basically the timing: Ton/Toff of Q1 controls the output voltage.



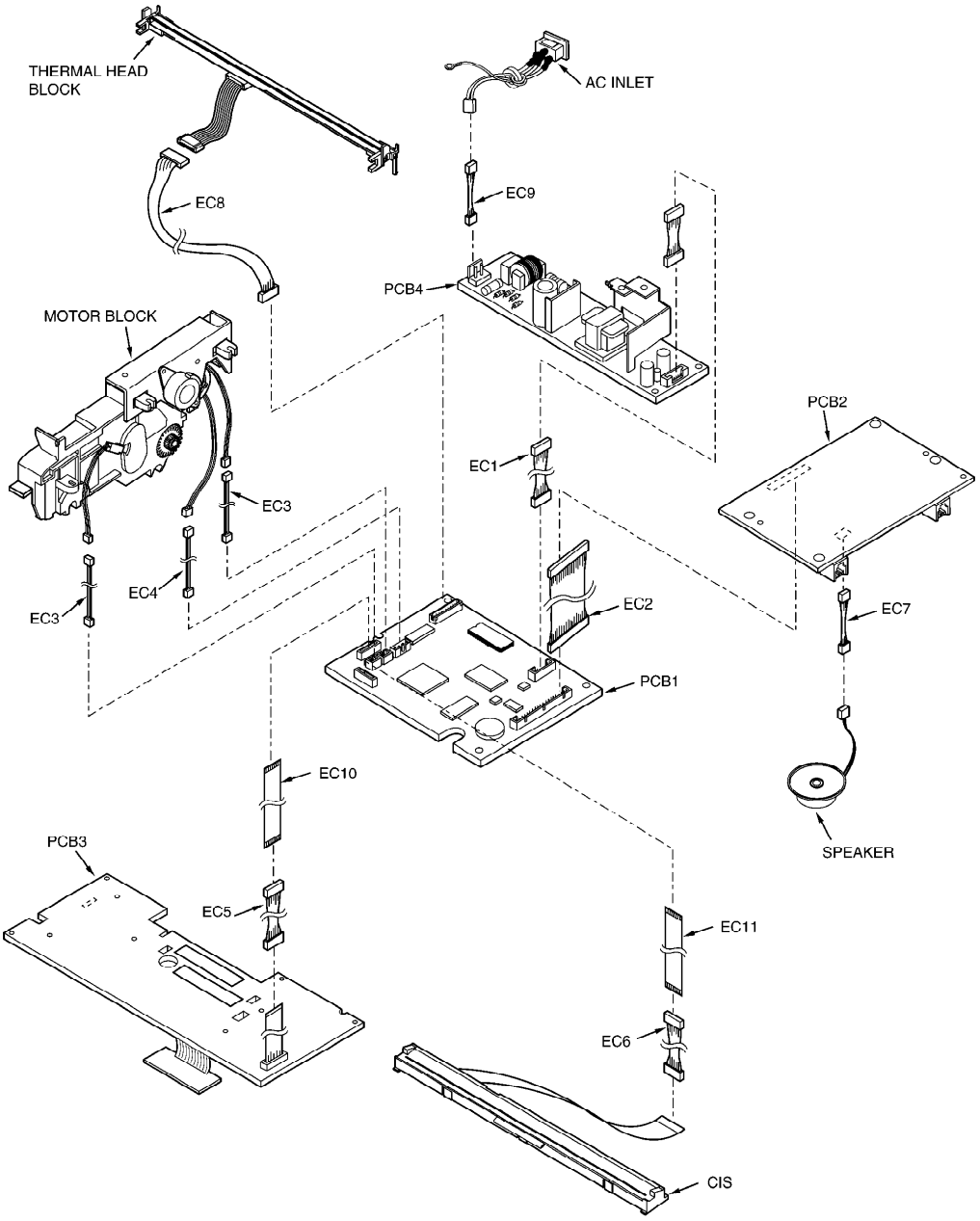
[Surge Absorber Circuit]
This circuit is for absorbing surge voltage generated by the transformer.
[Control Circuit and Detecting Circuit]
The control circuit amplifies the output with increased voltage detected in the error detecting circuit. Then it drives the main transistor.
In this power supply, the duty ratio is defined by changing the ON period of the main transistor. This is shown as follows.
When the output voltage of the 24V circuit increases, the current of the photo coupler PC101 increases, the pulse width of the output control IC becomes narrower and the ON period of Q101 becomes shorter.
[Over Current Limiter (O.C.L)]
The highest drain current (Q101) is limited by a limiter circuit (IC101) of 24V. The 24V output is

limited by this circuit.
[Over Voltage Circuit]
If the 24V output increases because the error detecting circuit or control circuit is broken, IC101 will recognize this signal and output becomes 0V.
Dummy load method (to quickly check the power supply output)
Refer to POWER SUPPLY BOARD SECTION ().

8. TERMINAL GUIDE OF THE IC'S TRANSISTORS AND DIODES

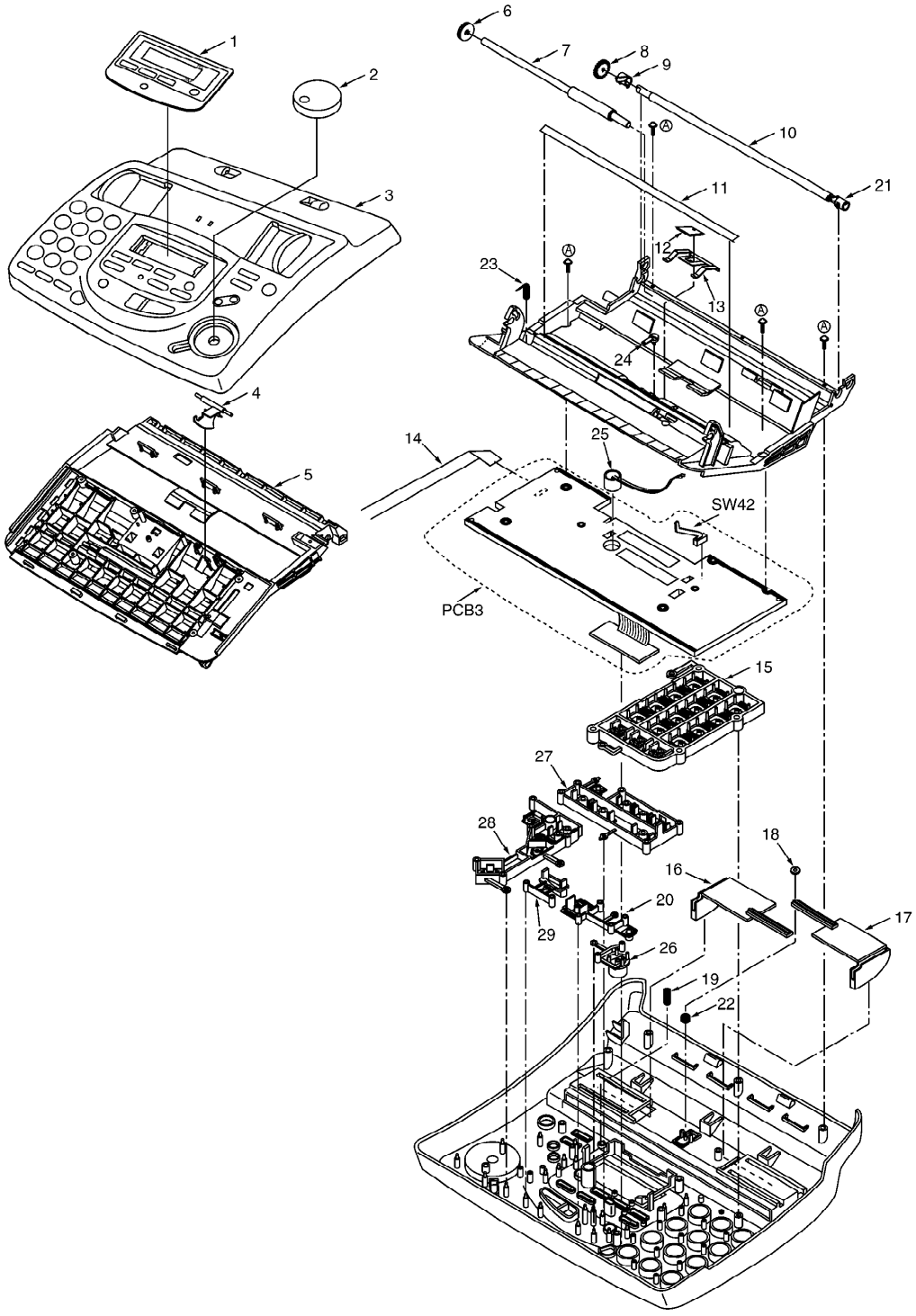
 PFVIR675814	 PFVIS80842AN	 PFVIBA12003	 PFVIKM29W4AT	 PFVIBU4066BF
 MN7D032Z9J	 PFWIFT67LA	 PQVIMC34119M PQVINJM4558M	PFVIMM1385EN	 AN1431T
 RFVITA7805F 2SK2640	 PQVTDTC143E PQVTDTC114EU 2SC4155R,2SC4155S 2SB1218A	 2SB1322	 PFVIM66426M1	 MA165
 PFVIM0525LFF	 PQVDERA1802 PFVDAG01A PQVDMZJ5R6A	 1SS131	 PFVD1N4005,MA4220 PFVDD1NL20U	 PFVDRMRLS245
 RLS71	PFVINJM2904M PFVTSI4431DY	 MA141WK	 PFVDSF5LC20U	 LNJ801LPDJA
 PFVIFA5317P				

9. FIXTURES AND TOOLS

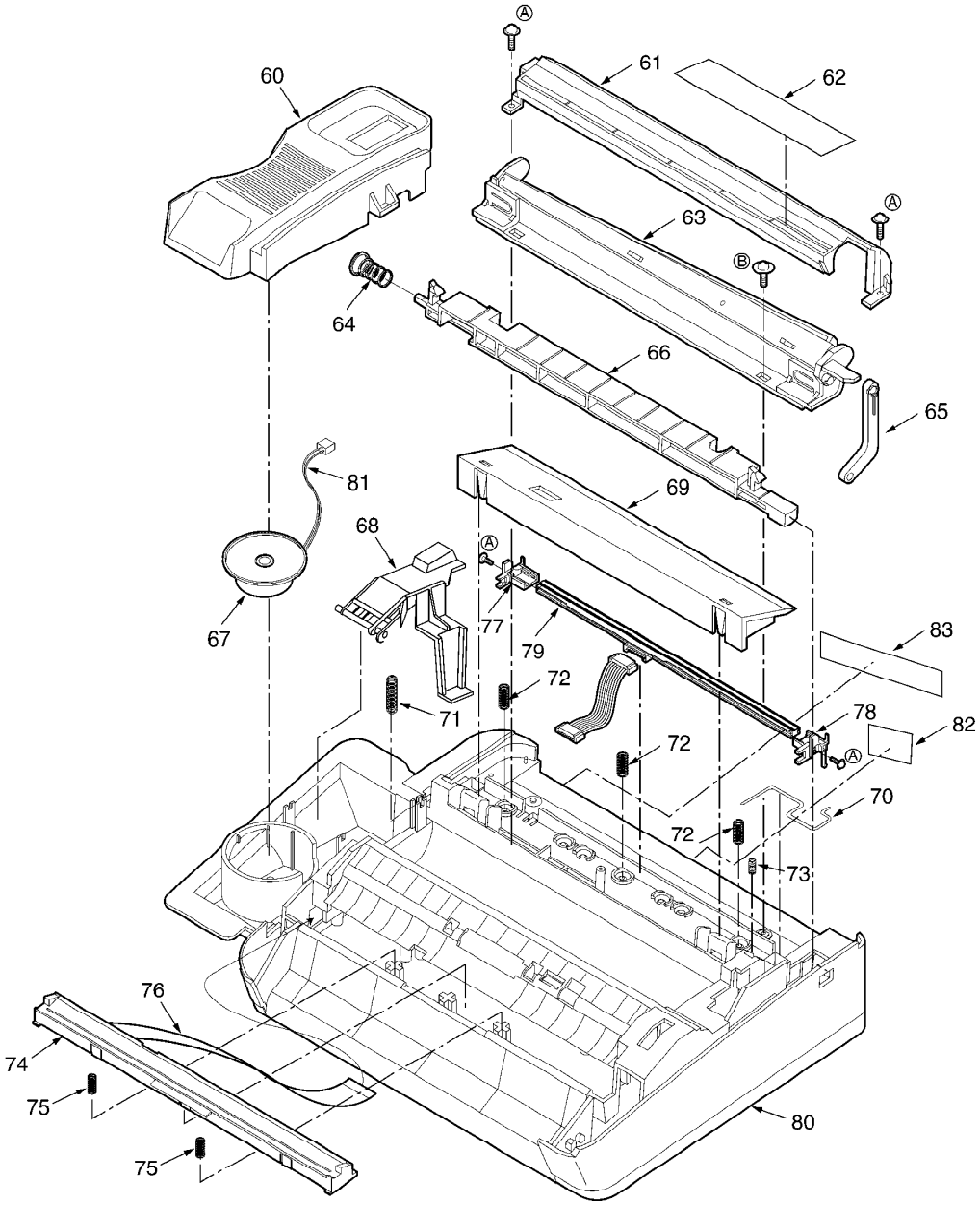


10. CABINET, MECHANICAL AND ELECTRICAL PARTS LOCATION

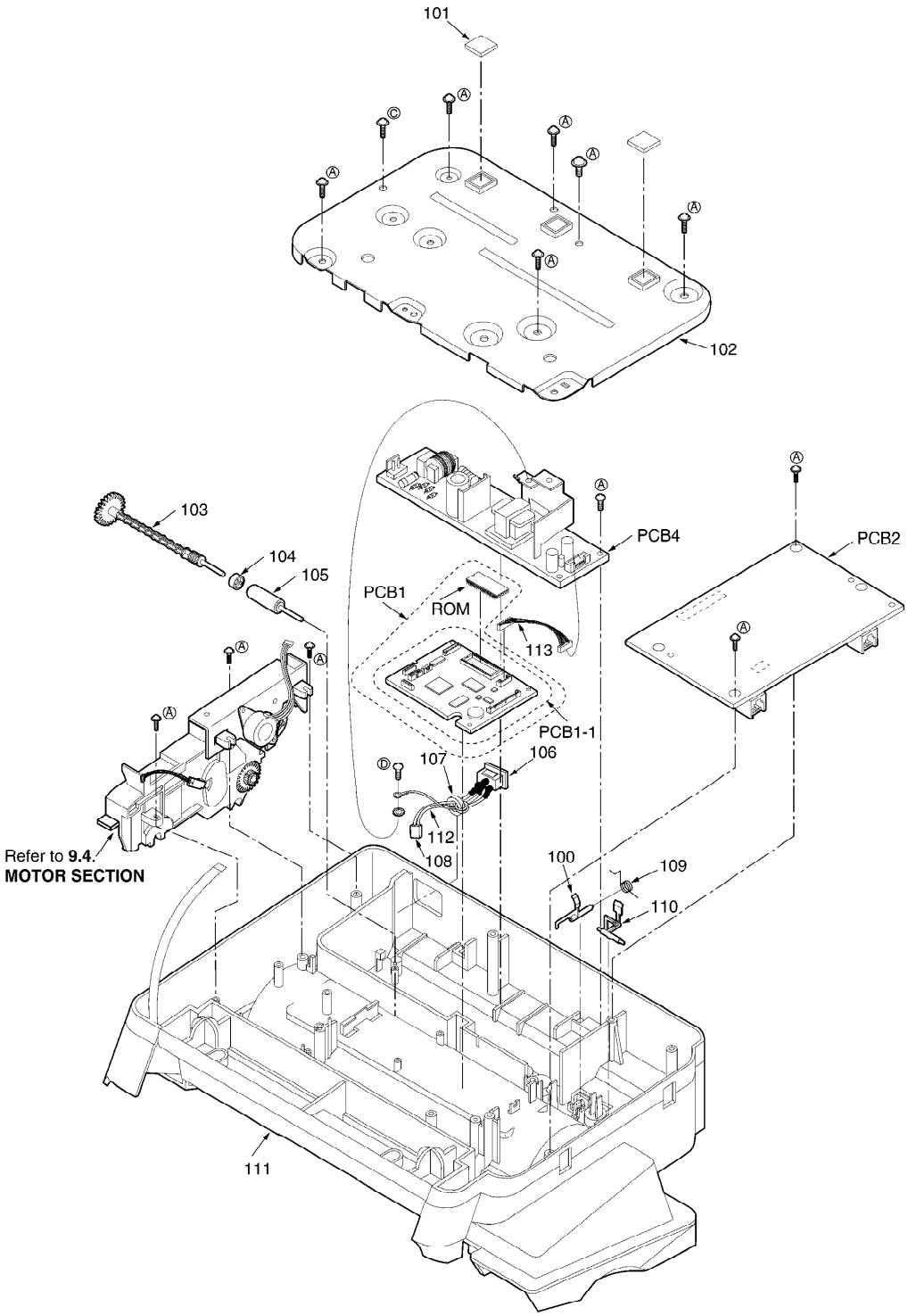
10.1. OPERATION PANEL SECTION



10.2. UPPER CABINET SECTION

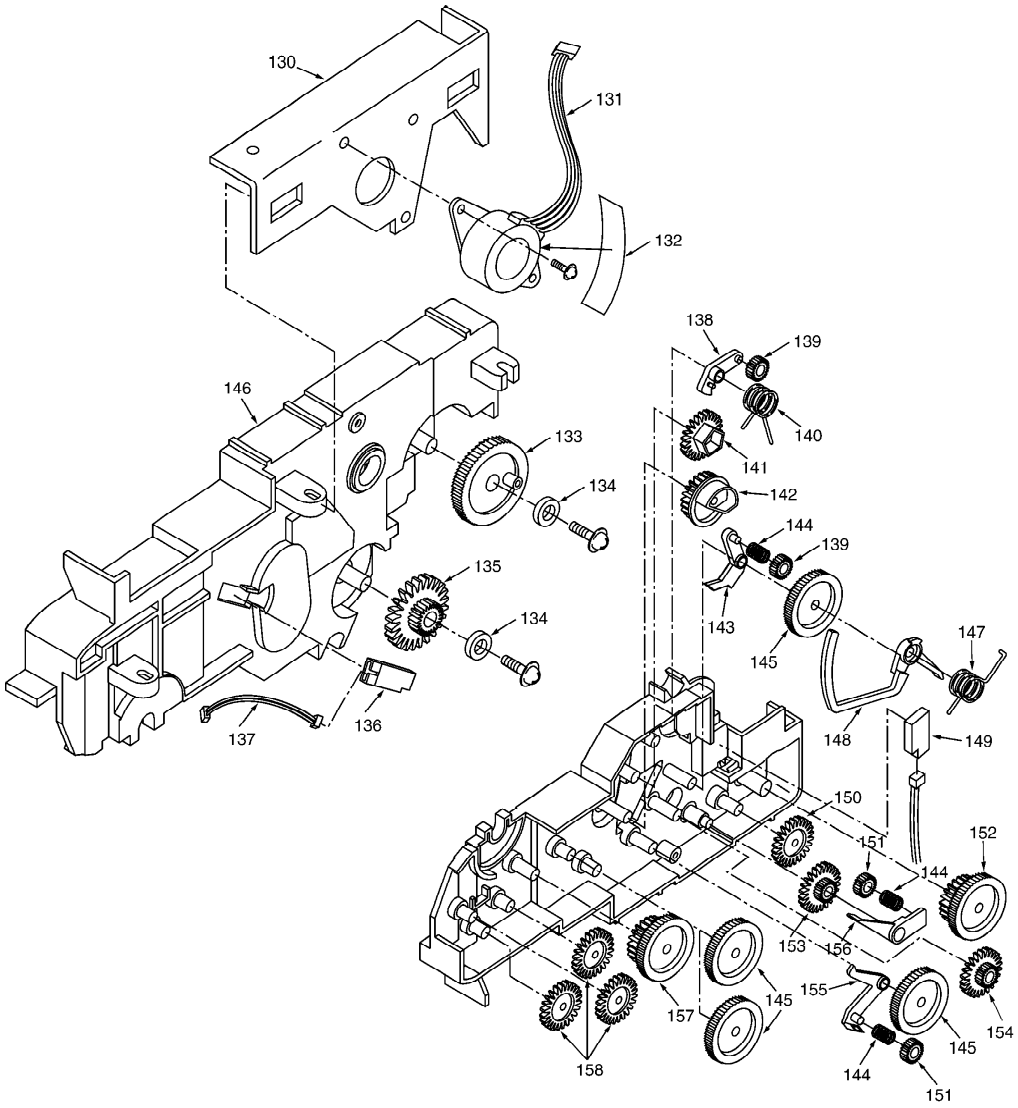


10.3. LOWER CABINET/P.C.B. SECTION

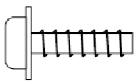
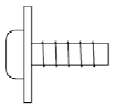
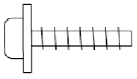


CROSS REFFERENCE:
MOTOR SECTION ()

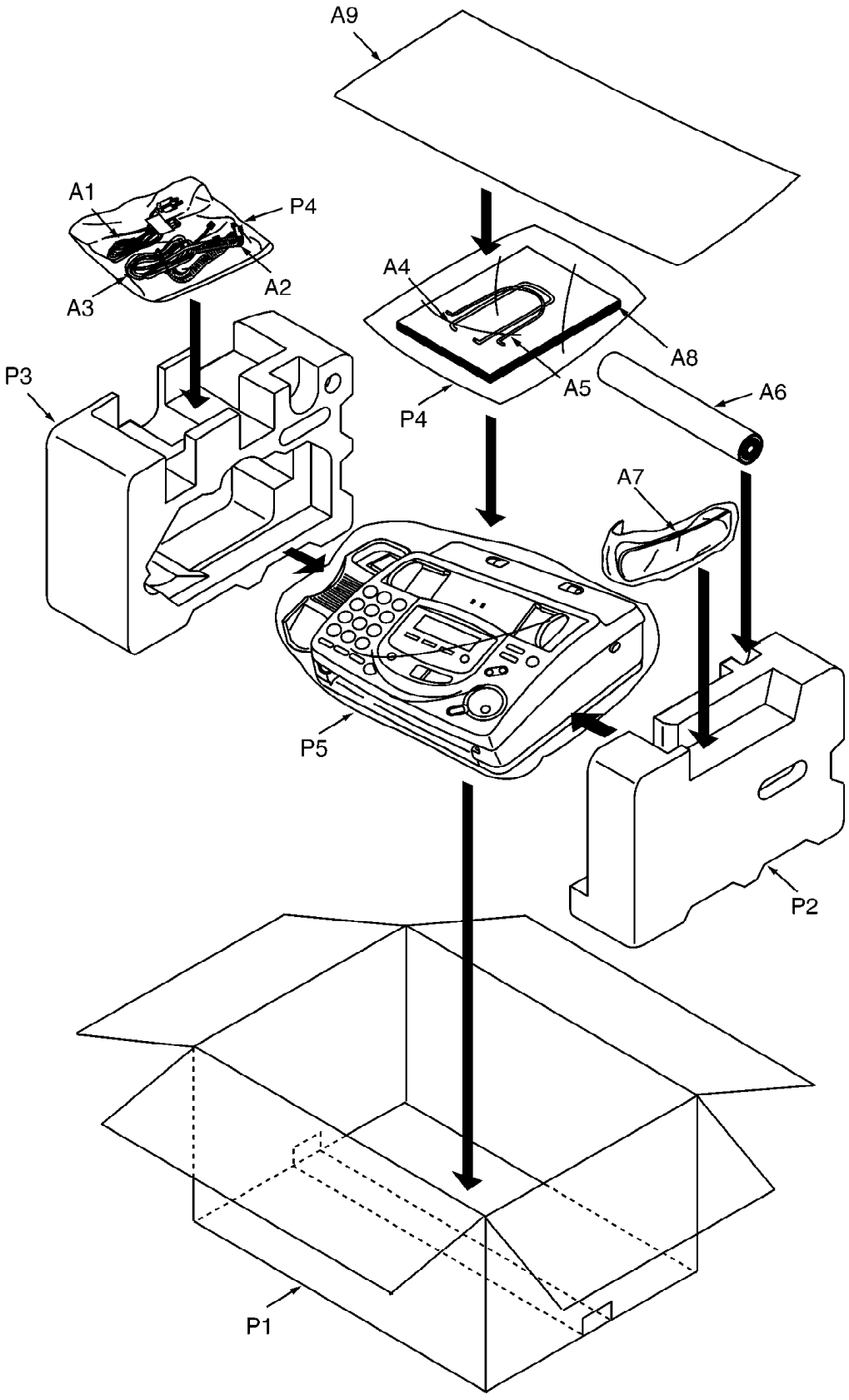
10.4. MOTOR SECTION



10.5. ACTUAL SIZE OF SCREWS AND WASHER

	Part No.	Illustration
Ⓐ	XTW3 + S10P	
Ⓑ	XTW3+W8P	
Ⓒ	XTW3+U6LFZ	
Ⓓ	XSB4+6	
Ⓔ	XWC4B	
Ⓕ	XTW2+R8PFN	

11. ACCESSORIES AND PACKING MATERIALS



12. REPLACEMENT PARTS LIST

This replacement parts list is for KX-FT68BR only.
Refer to the simplified manual (cover) for other areas.
Notes:

1. **The marking (RTL) indicates that the Retention Time is limited for this item.**
   After the discontinuation of this assembly in production, the item will continue to be available for a specific period of time. The retention period of availability is dependent on the type of assembly, and in accordance with the laws governing parts and product retention.
   After the end of this period, the assembly will no longer be available.
2. **Important safety notice / Components identified by ⚠ mark have special characteristics important for safety. When replacing any of these components, use only manufacture's specified parts.**
3. **The S mark indicates service standard parts and may differ from production parts.**
4. **RESISTORS & CAPACITORS / Unless otherwise specified; / All resistors are in ohms (Ω) K=1000 Ω , M=1000k Ω / All capacitors are in MICRO FARADS (μ F) P= μ μ F / *Type & Wattage of Resistor**

Type

ERC:Solid ERD:Carbon PQ4R:Chip	ERX:Metal Film ERG:Metal Oxide ERO:Metal Film	PQRD:Carbon PQRQ:Fuse ERF:Wire Wound

Wattege

10,16,18:1/8W	14,25,S2:1/4W	12,50,S1:1/2W	1:1W	2:2W	5:5W

ECFD:Semi-Conductor ECQS:Styrol PQCBX,ECUV:Chip ECMS:Mica	ECCD,ECKD,PQCBC,PQVP : Ceramic ECQM,ECQV,ECQE,ECQU,ECQB : Polyester ECEA,ECSZ,ECOS : Electrolytic ECQP : Polypropylene

Voltage

ECQ Type	ECQG ECQV Type	ECSZ Type	Others	
1H : 50V 2A : 100V 2E : 250V 2H : 500V	05 : 50V 1 : 100V 2 : 200V	OF : 3.15V 1A : 10V 1V : 35V OJ : 6.3V	OJ : 6.3V 1A : 10V 1C : 16V 1E,25 : 25V	1V : 35V 50,1H : 50V 1J : 63V 2A : 100V

12.1. CABINET AND ELECTRICAL PARTS

Ref. No.	Part No.	Part Name & Description	Remarks
		(11.1.1.OPERATION PANEL SECTION)	
1	PFGP1175Y	PANEL, LCD	
2	PFBE1006Z1	DIAL,JOG	S
3	PFGG1053Y2	GRILLE OPERATION PANEL	S
4	PFDE1096Z	LEVER, DOCUMENT DETECTION	
5	PFUV1029Y	COVER, OPERATION	
6	PFDG1170Z	GEAR, PLATEN	
7	PFDN1044Z	ROLLER, PLATEN	
8	PFDG1123Z	GEAR, PLATEN	
9	PFDJ1021Z	PLATEN SPACER, R	
10	PFDN1033Z	ROLLER, PLATEN	
11	PFHX1360Z	COVER READING SHEET	
12	PFHG1064Z	SEPARATION RUBBER	
13	PFUS1173Z	SPRING, DOCUMENT FEED	
14	PFJE1015Z	LEAD WIRE	
15	PFBX1113Z1	KEY, DIAL	S
16	PFKR1015Z3	DOCUMENT GUIDE,R	S
17	PFKR1014Z3	DOCUMENT GUIDE,L	S
18	PFDG1015Y	GEAR,DOCUMENT GUIDE	
19	PFUS1170Z	SPRING,DOCUMENT LEVER	
20	PFBC1064Z2	KEY,STOP	S
21	PFDJ1020Z	PLATEN SPACER, L	
22	PFUS1222Z	SLIDER SPRING	
23	PFUS1286Z	SPRING, OPERATION EARTH	
24	PFDE1101Z	LEVER	
25	PQJM128Z	BUILTIN-MICROPHONE	
26	PFBC1066Z2	KEY,SP-PHONE	S
27	PFBX1115Z1	KEY,FUNCTION	S
28	PFBX1114Z2	KEY,6	S
29	PFBC1065Z1	KEY,START	S
		(11.1.2. UPPER CABINET AND THERMAL HEAD SECTION)	
60	PFKM1049Z4	HANDSET CRADLE	S
61	PFKV1026Z2	COVER,CUTTER	S
62	PFQT1698Y	CAUTION LABEL	
63	PFDX1025Z	CUTTER UNIT	
64	PFUS1179Z	LOOK LEVER SPRING	
65	PFDE1137Z1	LEVER,LOCK	S
66	PFHR1219Z	COVER,HEAD	
67	PFAS50P003Z	SPEAKER	
68	PFBH1011Z1	BUTTON,HOOK	S
69	PFHR1214Z	ARM,CUTTER	
70	PFUS1256Z	SPRING,EARTH CUTTER	
71	PFUS1176Z	SPRING,OPERATION COVER OPEN	
72	PFUS1318Z	THERMAL HEAD SPRING	
73	PFUS1257Z	SPRING,EARTH HEAD	
74	PF0U1023Z	IMAGE SENSOR	
75	PFUS1285Z	SPRING,CIS	
76	PFJE1005Z	LEAD WIRE	
77	PFDE1135Z	HEAD GUIDE,L	
78	PFDE1136Z	HEAD GUIDE,R	
79	PFJHS023Z	THERMAL HEAD	
80	PFJS12Q80Z	LEAD,THERMAL	
81	PFJS02Q42Z	CONNECTOR, 2PIN	
82	PFGT1662Z-C	NAME PLATE	

Ref. No.	Part No.	Part Name & Description	Remarks
83	PFQT1186XA	CAUTION LABEL	
		(11.1.3. LOWER SECTION)	
100	PFUS1319ZA	SPRING,SENSOR	
101	PFHA1001Z	LEG RUBBER	
102	PFMD1046Z	FRAME BOTTOM	
103	PFDF1051Z	SHAFT	
104	PFDE1133Z	SPACER	
105	PFDR1015Z	ROLLER SUPPORT	
106	PFJP03S04Z	AC INLET	⚠
107	PQLB1E1	FERRITE CORE	
108	PQJS02Q59Y	CONNECTOR,2PIN	
109	PFDE1097Z	PAPER SENSOR LEVER	
110	PFDE1134Z	LEVER,JAM SENSOR	
111	PFKM1064Y1	CABINET,MAIN	S
112	XK20CM4HW	EARTH LEAD	S
113	PFJS07Q81Z	LEAD,POWER	
		(11.1.4. GEAR CHASSIS SECTION)	
130	PFMH1084Z	MOTOR PLATE	
131	35S1S15DCNR	MOTOR	S
132	PFHX1399Z	MOTER SHEET	
133	PFDG1174Z	GEAR,CUTTER	
134	PFHX1413Z	GEAR SHEET	
135	PFDG1119Y	GEAR	
136	PQST2A04Z	SENSOR	
137	PFJS03Q43Z	SENSOR LEAD	
138	PFHR1218Z	ARM	
139	PFDG1021Z	GEAR,C	
140	PFUS1251Z	SPRING,BACK	
141	PFDG1167Z	GEAR,MODE	
142	PFDG1168Z	GEAR,MODE	
143	PFHR1217Z	ARM	
144	PFUS1253Z	SPRING,GEAR	
145	PFDG1022Z	GEAR,D	
146	PFUA1026Z	BASE,GEAR	
147	PFUS1252Z	SPRING,CUTTER	
148	PFHR1215Z	ARM,CUTTER	
149	PFJS03Q79Z	LEAD	
150	PFDG1129Z	GEAR S	
151	PFDG1134Z	GEAR,C	
152	PFDG1173Z	GEAR,CUTTER	
153	PFDG1132Y	GEAR,A	
154	PFDG1172Z	GEAR,BASE	
155	PFHR1216Z	ARM	
156	PFHR1213Z	ARM,CUTTER	
157	PFDG1171Z	GEAR,SENDING	
158	PFDG1169Z	GEAR	
		(11.1.5. ACCESSORIES AND PACKING MATERIALS)	
A1	PFJA1016Y	POWER CORD	⚠
A2	PQJA10075Z	TEL CORD	
A3	PFJA1029Y	CURL CORD	
A4	PFUS1167Z	STACKER	
A5	PQUS10136Z	PAPER STACKER	
A6	PQHP10023Z	ROLL PAPER	
A7	PFJXE0808Z	HANDSET	

Ref. No.	Part No.	Part Name & Description	Remarks
A8	PFQX1461Z	INSTRUCTION BOOK	
A9	PFQW1406Z	INSTRUCTION BOOK (QUICK START SHEET)	
P1	PFPE1102Z-C	GIFT BOX ASS'Y	S
P2	PFPN1230Z	CUSHION	
P3	PFPN1229Z	CUSHION	
P4	PQPP10005Z	BAG,POLYETHYLENE	
P5	PFPH1030Z	SOFT SHEET	

12.2. DIGITAL BOARD PARTS

Ref. No.	Part No.	Part Name & Description	Remarks
PCB1	PFWP1FT68BR	DIGITAL BOARD ASS`Y (RTL)	
PCB-1	PFWP2FT68BR	DIGITAL BOARD ASS`Y (RTL)(without ROM)	
		Refer to 9.3 Lower/P.C.B SECTION(P147).	
		(ICS)	
IC1	PFVIM66426M1	IC	
IC2	PFWIFT68BR	IC (ROM)	
IC3	PFVIS80842AN	IC	S
IC4	PFVIM0525LFF	IC	
IC5	PFVIR675814	IC	
IC6	PFVIKM29W4AT	IC	
IC7	PFVIMM1385EN	IC	
IC8	PQVIBA12003	IC	S
IC9	PQVITC4066BF	IC	S
IC10	PQVINJM4558M	IC	S
IC11	PFVINJM2904M	IC	S
		(TRANSISTORS)	
Q3	2SC4155S	TRANSISTOR(SI)	
Q4	2SC4155S	TRANSISTOR(SI)	
Q5	2SC4155S	TRANSISTOR(SI)	
Q6	2SC4155S	TRANSISTOR(SI)	
Q7	2SB1218A	TRANSISTOR(SI)	
Q8	PQVTDTC114EU	TRANSISTOR(SI)	
Q9	PQVTDTC114EU	TRANSISTOR(SI)	
Q10	2SB1322	TRANSISTOR(SI)	S
Q11	PQVTDTC114EU	TRANSISTOR(SI)	
Q12	PFVTSI4431DY	TRANSISTOR(SI)	
		(DIODES)	
D1	RLS71	DIODE(SI)	
D3	PFVDRMRLS245	DIODE(SI)	
D4	PQVD1N7200R	DIODE(SI)	
DA1	MA141WK	DIODE(SI)	
		(CONNECTORS)	
CN2	PQJP18A19Z	CONNECTOR,18PIN	
CN3	PQJP5G30Y	CONNECTOR,5PIN	
CN5	PQJP2G30Y	CONNECTOR,2PIN	S
CN6	PQJP02G100Z	CONNECTOR,2PIN	
CN8	PFJS10A13Z	CONNECTOR,10PIN	
CN4	PFJP12A12Z	JACK	
		(COILS)	
L2	PQLQR1ET	COIL	

Ref. No.	Part No.	Part Name & Description	Remarks
L3	PQLQR2KA20T	COIL	
L5	PQLQR1ET	COIL	
L8	PQLQR2KA20T	COIL	
L10	PQLQR2KA113T	COIL	
L11	PQLQR2KA113T	COIL	
		(BATTERY)	
BAT1	PFSU1004Z	BATTERY	S
		(COMPONENTS PARTS)	
RA1	EXRV8V271JV	COMPONENTS PARTS	
RA2	EXRV8V271JV	COMPONENTS PARTS	
RA3	EXRV8V271JV	COMPONENTS PARTS	
RA4	EXRV8V271JV	COMPONENTS PARTS	
RA5	EXRV8V271JV	COMPONENTS PARTS	
RA6	EXRV8V271JV	COMPONENTS PARTS	
RA7	EXRV8V101JV	COMPONENTS PARTS	
RA8	EXRV8V101JV	COMPONENTS PARTS	
		(CRYSTAL OSCILLATORS)	
X1	PFVC3276AZA	CRYSTAL OSCILLATOR	
X2	PFVBKB240ZAT	CRYSTAL OSCILLATOR	
X3	PFVC32256ZAT	CRYSTAL OSCILLATOR	
		(FUSE)	
F2	PFRB001251KC	FUSE	
F5	PFRB002122KZ	FUSE	
		(RESISTORS)	
F3	ERJ6GEY0R00	0	
F4	ERJ6GEY0R00	0	
J2	ERJ8GEY0R00	0	
J3	ERJ3GEY0R00	0	
J6	ERJ3GEY0R00	0	
J9	ERJ3GEY0R00	0	
L1	ERJ3GEY0R00	0	
L4	ERJ3GEY0R00	0	
L6	PQ4R18XJ100	0	S
L7	ERJ3GEY0R00	0	
L12	ERJ3GEY0R00	0	
L13	ERJ3GEY0R00	0	
L14	ERJ3GEYJ101	0	
L15	ERJ3GEY0R00	0	
L16	ERJ3GEYJ101	0	
L17	ERJ3GEYJ101	0	
L18	ERJ3GEYJ101	0	
L19	ERJ3GEYJ101	0	
L20	ERJ3GEY0R00	0	
L21	ERJ3GEY0R00	0	
L22	ERJ3GEY0R00	0	
L23	ERJ3GEY0R00	0	
L24	ERJ3GEY0R00	0	
L25	ERJ3GEY0R00	0	
R1	ERJ3GEYJ103	10k	
R2	ERJ3GEYJ203	20k	
R3	ERJ3GEYJ472	4.7k	
R4	ERJ3GEY0R00	0	
R5	ERJ3GEYJ271	270	
R6	ERJ3GEY0R00	0	

Ref. No.	Part No.	Part Name & Description	Remarks
R7	ERJ3GEYJ271	270	
R8	ERJ3GEYJ271	270	
R10	ERJ3GEY0R00	0	
R11	ERJ3GEYJ271	270	
R12	ERJ3GEYJ271	270	
R13	ERJ3GEYJ271	270	
R14	ERJ3GEYJ472	4.7k	
R15	ERJ3GEYJ103	10k	
R16	ERJ3GEYJ471	470	
R17	ERJ3GEYJ472	4.7k	
R18	ERJ3GEYJ101	100	
R19	ERJ3GEYJ271	270	
R20	ERJ3GEYJ101	100	
R22	ERJ3GEY0R00	0	
R24	ERJ3GEYJ222	2.2k	
R25	ERJ3GEY0R00	0	
R28	ERJ3GEYJ562	5.6k	
R30	ERJ3GEY0R00	0	
R31	ERJ3EKF1101	0	
R32	ERJ3EKF4701	0	
R34	ERJ3GEYJ104	100k	
R36	ERJ3GEYJ103	10k	
R37	ERJ3GEYJ103	10k	
R38	ERJ3GEYJ103	10k	
R41	ERJ3GEYJ222	2.2k	
R42	ERJ3GEYJ473	47k	
R43	ERJ3GEYJ124	120k	
R44	ERJ3GEYJ334	330k	
R45	ERJ3GEY0R00	0	
R46	ERJ3GEYJ102	1k	
R47	ERJ3GEYJ433	43k	
R48	ERJ3GEYJ224	220k	
R49	ERJ3GEYJ222	2.2k	
R50	ERJ3GEYJ334	330k	
R51	ERJ3GEYJ393	39k	
R52	ERJ3GEYJ472	4.7k	
R54	ERJ3GEYJ272	2.7k	
R55	ERJ3GEYJ183	18k	
R56	ERJ3GEYJ393	39k	
R57	ERJ3GEYJ104	100k	
R58	ERJ3GEYJ472	4.7k	
R59	ERJ3GEYJ472	4.7k	
R60	ERJ3GEYJ224	220k	
R61	ERJ3GEYJ102	1k	
R62	ERJ3GEYJ222	2.2k	
R63	ERJ3GEYJ682	6.8k	
R64	ERJ3GEYJ222	2.2k	
R65	ERJ3GEYJ472	4.7k	
R66	ERJ3GEYJ101	100	
R67	ERJ3GEYJ222	2.2k	
R68	ERJ3GEYJ182	1.8k	
R69	ERJ3GEYJ102	1k	
R70	ERJ3GEYJ103	10k	
R73	ERJ3GEYJ433	43k	

Ref. No.	Part No.	Part Name & Description	Remarks
R74	ERJ3GEY0R00	0	
R75	ERJ3GEYJ472	4.7k	
R77	ERJ3GEYJ273	27k	
R78	ERJ3GEYJ683	68k	
R82	ERJ3GEYJ474	470k	
R84	ERJ3GEY0R00	0	
R85	ERJ8GEYJ8R2	8.2	
R95	ERJ3GEYJ103	10k	
R96	ERJ3GEYJ622	6.2k	
R97	ERJ3GEYJ103	10k	
R98	ERJ3GEYJ224	220k	
R99	ERJ3GEYJ224	220k	
R100	ERJ3GEY0R00	0	
R101	ERJ3GEYJ331	330	
R102	ERJ3GEYJ6R8	6.8	
R103	ERJ3GEYJ470	47	
R104	ERJ3GEYJ224	220k	
R105	ERJ3GEYJ222	2.2k	
R106	ERJ3GEYJ103	10k	
R108	ERJ3GEY0R00	0	
R109	ERJ3GEYJ102	1k	
R110	ERJ3GEYJ102	1k	
R111	ERJ3GEYJ473	47k	
R112	ERJ3GEYJ473	47k	
R114	ERJ3GEYJ472	4.7k	
R115	ERJ3GEYJ472	4.7k	
R116	ERJ3GEYJ102	1k	
R117	ERJ3GEYJ102	1k	
R118	ERJ3GEYJ101	100	
R119	ERJ3GEYJ101	100	
R120	ERJ3GEYJ101	100	
R121	ERJ3GEYJ101	100	
R122	ERJ3GEY0R00	0	
R123	ERJ3GEYJ101	100	
R124	ERJ3GEYJ823	82k	
R125	ERJ3GEYJ223	22k	
R126	ERJ3GEYJ562	5.6k	
R127	ERJ3GEYJ472	4.7k	
R128	ERJ3GEYJ821	820	
R132	ERJ3GEYJ273	27k	
		(CAPACITORS)	
C1	ECUV1H104ZFV	0.1	S
C2	ECUV1H222KBV	0.0022	
C3	ECUV1H104ZFV	0.1	S
C4	ECUV1H102KBV	0.001	
C5	ECUV1H102KBV	0.001	
C6	ECUV1H104ZFV	0.1	S
C7	ECUV1H104ZFV	0.1	S
C8	ECUV1H104ZFV	0.1	S
C9	ECUV1H104ZFV	0.1	S
C10	ECUV1H104ZFV	0.1	S
C11	ECUV1H104ZFV	0.1	S
C12	ECUV1C104KBV	0.1	
C13	ECUV1H104ZFV	0.1	S

Ref. No.	Part No.	Part Name & Description	Remarks
C14	ECUV1C104KBV	0.1	
C15	ECUV1H104ZFV	0.1	S
C16	ECUV1H104ZFV	0.1	S
C17	ECUV1H120JCV	12P	
C18	ECUV1H150JCV	15P	
C19	ECUV1H104ZFV	0.1	S
C20	ECUV1H104ZFV	0.1	S
C21	ECUV1H104ZFV	0.1	S
C22	ECUV1H104ZFV	0.1	S
C24	ECEA1CK101	100	S
C25	ECUV1H104ZFV	0.1	S
C26	ECUV1H104ZFV	0.1	S
C27	ECUV1H104ZFV	0.1	S
C28	ECUV1H104ZFV	0.1	S
C29	ECUV1H150JCV	15P	
C30	ECUV1H150JCV	15P	
C31	ECUV1H104ZFV	0.1	S
C33	ECUV1H100DCV	10P	
C35	ECUV1H104ZFV	0.1	S
C36	ECUV1H104ZFV	0.1	S
C37	ECUV1H104ZFV	0.1	S
C38	ECUV1H104ZFV	0.1	S
C39	ECUV1H104ZFV	0.1	S
C40	ECEA0JK221	220	S
C41	ECUV1H104ZFV	0.1	S
C42	PQCUV1H104ZF	0.1	
C43	ECUV1C104KBV	0.1	
C44	ECUV1H102KBV	0.001	
C46	ECUV1C104KBV	0.1	
C47	ECUV1C104KBV	0.1	
C48	ECUV1H101JCV	100P	
C49	ECUV1C104KBV	0.1	
C50	ECUV1H681KBV	680P	
C51	ECEA1CKS100	10	S
C52	ECEA1CKS100	10	S
C53	ECUV1H330JCV	33P	
C55	ECUV1H104ZFV	0.1	S
C56	ECUV1H104ZFV	0.1	S
C57	ECUV1H104ZFV	0.1	S
C58	ECUV1C104KBV	0.1	
C59	ECUV1C104KBV	0.1	
C60	ECUV1H103KBV	0.01	
C61	ECUV1C104KBV	0.1	
C62	ECUV1H331JCV	330P	S
C63	ECUV1C104KBV	0.1	
C65	ECUV1C104KBV	0.1	
C66	ECUV1C104KBV	0.1	
C67	ECUV1H472KBV	0.0047	
C69	ECUV1H104ZFV	0.1	S
C68	ECUV1H472KBV	0.0047	S
C70	ECUV1C104KBV	0.1	
C71	ECUV1H333KDV	0.033	S
C72	ECUV1C104KBV	0.1	
C73	ECUV1H100DCV	10P	

Ref. No.	Part No.	Part Name & Description	Remarks
C74	ECUV1H100DCV	10P	
C75	ECUV1C104KBV	0.1	
C76	ECUV1H104ZFV	0.1	S
C77	ECUV1C104KBV	0.1	
C78	ECUV1H104ZFV	0.1	S
C79	ECEA1CKS100	10	S
C80	ECUV1C104KBV	0.1	
C82	ECUV1C104KBV	0.1	
C85	ECUV1H104ZFV	0.1	S
C87	ECUV1C104KBV	0.1	
C88	ECUV1C104KBV	0.1	
C90	ECEA1CKS100	10	S
C91	ECUV1H104ZFV	0.1	S
C92	ECUV1H104ZFV	0.1	S
C93	ECEA1CKS100	10	S
C94	ECUV1H103KBV	0.01	
C96	ECEA1CKS100	10	S
C97	ECUV1H101JCV	100P	
C98	ECUV1H104ZFV	0.1	S
C100	ECUV1H104ZFV	0.1	S
C101	ECUV1H104ZFV	0.1	S
C102	ECUV1H390JCV	39P	
C103	ECEA1CKS100	10	S
C104	ECEA1CKS100	10	S
C105	ECUV1H104ZFV	0.1	S
C106	ECUV1H104ZFV	0.1	S
C107	ECEA0JK221	220	S
C119	ECEA1CKS470	47	S
C121	PQCUV1H104ZF	0.1	
C122	ECUV1H104ZFV	0.1	S
C124	ECEA1CKS100	10	S
C125	ECUV1H104ZFV	0.1	S
C126	ECEA1CK101	100	S
C127	ECUV1H102KBV	0.001	
C128	ECUV1H102KBV	0.001	
C129	ECUV1H102KBV	0.001	
C130	ECUV1H102KBV	0.001	
C131	ECUV1H102KBV	0.001	
C139	ECUV1H561JCV	560P	S
C140	PQCUV1E473MD	0.047	S
C152	ECUV1C334ZFV	0.33	
C153	ECUV1H271JCV	270P	

12.3. ANALOG BOARD PARTS

Ref. No.	Part No.	Part Name & Description	Remarks
PCB2	PFLP1295BXZ	ANALOG BOARD ASS'Y (RTL)	⚠
		(ICS)	
IC1	PQVIMC34119M	IC	S
IC2	PFVINJM2904M	IC	S
		(TRANSISTORS)	
Q2	2SC4155R	TRANSISTOR(SI)	
Q3	PQVTDTC143E	TRANSISTOR(SI)	
		(DIODES)	
D6	1SS131	DIODE(SI)	
D8	1SS131	DIODE(SI)	
D9	1SS131	DIODE(SI)	
D11	PQVDMZJ5R6A	DIODE(SI)	
D12	PQVDMZJ5R6A	DIODE(SI)	
		(JACKS AND CONNECTOR)	
CN2	PQJP02G100Z	CONNECTOR, 2PIN	
CN3	PQJJ1TB18Z	JACK	S
CN4	PFJJ1T01Z	JACK	S
		(SWITCHES)	
SW1	PFSH1A03Z	SWITCH	
SW2	ESE14A211	SWITCH	
SW3	PFSH1A03Z	SWITCH	
		(COILS)	
L1	PQLQR2BT	COIL	S
L2	PQLQR2BT	COIL	S
L5	PQLQR1RM601	COIL	S
L8	PQLQR1RM601	COIL	S
		(PHOTO ELECTRIC TRANSDUCERS)	
PC1	PQVIPC814K	PHOTO ELECTRIC TRANSDUCER	⚠
PC2	PFVITLP320	PHOTO ELECTRIC TRANSDUCER	⚠
		(RELAY)	
RLY1	PFSL003Z	RELAY	⚠
		(VARISTORS)	
SA1	PFRZRA311P6T	VARISTOR	⚠
SA2	PFVDRA102M	VARISTOR	S
		(TRANSFORMER)	
T2	PFLT8E009	TRANSFORMER	⚠
POS1	PFRT002	TRANSFORMER	
		(RESISTORS)	
JJ201	ERJ3GEY0R00	0	
L6	ERJ3GEY0R00	0	
L7	ERJ3GEY0R00	0	
R1	ERJ3GEYJ101	100	
R2	ERJ3GEYJ472	4.7k	
R3	ERJ3GEYJ101	100	
R4	ERJ3GEYJ472	4.7k	
R5	ERJ3GEYJ101	100	
R6	ERJ3GEYJ472	4.7k	
R12	ERG2SJ151	150	
R14	ERDS2TJ221	220	
R16	ERDS1TJ473	47k	
R17	ERDS1TJ103	10k	
R18	ERJ3GEYJ273	27k	
R19	ERJ3GEYJ222	2.2k	

Ref. No.	Part No.	Part Name & Description	Remarks
R31	ERDS2TJ471	470	
R33	ERJ3GEYJ563	56k	
R34	ERJ3GEYJ563	56k	
R35	ERJ3GEYJ823	82k	
R36	ERJ3GEYJ823	82k	
R37	ERJ3GEYJ222	2.2k	
R39	ERJ3GEYJ123	12k	
R41	ERJ3GEY0R00	0	
R42	ERJ3GEYJ513	51k	
R45	ERJ3GEYJ331	330	
R46	ERJ3GEYJ152	1.5k	
R47	ERJ3GEYJ152	1.5k	
R48	ERJ3GEYJ153	15k	
R49	ERJ3GEYJ153	15k	
R50	ERJ3GEYJ394	390k	
R51	ERJ3GEYJ224	220k	
R52	ERJ3GEYJ222	2.2k	
R53	ERJ3GEY0R00	0	
R62	ERJ3GEYJ473	47k	
R63	ERJ3GEYJ331	330	
R64	ERJ3GEYJ223	22k	
R67	ERJ3GEY0R00	0	
R72	ERJ3GEYJ154	150k	
R73	ERJ3GEYJ114	110k	
R74	ERJ3GEYJ103	10k	
R75	ERJ3GEYJ153	15k	
R80	ERJ3GEYJ103	10k	
R81	ERJ3GEYJ622	6.2k	
		(CAPACITORS)	
C1	ECUV1H103KBV	0.01	
C2	ECUV1H103KBV	0.01	
C3	ECUV1H103KBV	0.01	
C8	ECUV1H103KBV	0.01	
C11	ECQE2E105KZ	1	S
C20	ECUV1H103KBV	0.01	
C23	ECUV1C104KBV	0.1	
C24	ECUV1C104KBV	0.1	
C25	ECUV1H221JCV	220P	
C26	ECUV1H104ZFV	0.1	S
C30	ECEA1HKS4R7	4.7	S
C31	ECUV1C273KBV	0.027	
C33	ECUV1H182KBV	0.0018	S
C43	ECUV1H102KBV	0.001	
C44	ECEA1HKS4R7	4.7	S
C46	ECUV1H103KBV	0.01	
C47	ECEA1CKS100	10	S
C48	ECEA1CKS470	47	S
C49	ECUV1H472KBV	0.0047	
C51	ECUV1H103KBV	0.01	
C52	ECUV1H103KBV	0.01	
C53	ECUV1H333KDV	0.033	S
C54	ECUV1H333KDV	0.033	S
C55	ECUV1H271JCV	270P	
C50	ERJ3GEY0R00	0	

Ref. No.	Part No.	Part Name & Description	Remarks
C57	ERJ3GEY0R00	0	
C58	ECEA1CKS470	47	S
C61	ECEA1CKS470	47	S
		(THERMISTOR)	
POS1	PFRT002	THERMISTOR	

12.4. OPERATION BOARD PARTS

Ref. No.	Part No.	Part Name & Description	Remarks
PCB3	PFWP3FT68BR	OPERATION BOARD ASS'Y(RTL)	
		(ICS)	
IC1	MN7D032Z9J	IC	
		(TRANSISTORS)	
Q1	2SC4155R	TRANSISTOR(SI)	
		(DIODE)	
LED1	LNJ801LPDJA	DIODE(SI)	
		(LIQUID CRYSTAL DISPLAY)	
CN2	PFAVM190B	LIQUID CRYSTAL DISPLAY	
		(PHOTO ELECTRIC TRANSDUCER)	
PS1	CNA1006N	PHOTO ELECTRIC TRANSDUCER	
		(SWITCHES)	
SW1	EVQ11Y05B	SWITCH	
SW2	EVQ11Y05B	SWITCH	
SW3	EVQ11Y05B	SWITCH	
SW4	EVQ11Y05B	SWITCH	
SW5	EVQ11Y05B	SWITCH	
SW6	EVQ11Y05B	SWITCH	
SW7	EVQ11Y05B	SWITCH	
SW9	EVQ11Y05B	SWITCH	
SW10	EVQ11Y05B	SWITCH	
SW11	EVQ11Y05B	SWITCH	
SW12	EVQ11Y05B	SWITCH	
SW13	EVQ11Y05B	SWITCH	
SW14	EVQ11Y05B	SWITCH	
SW15	EVQ11Y05B	SWITCH	
SW16	EVQ11Y05B	SWITCH	
SW17	EVQ11Y05B	SWITCH	
SW18	EVQ11Y05B	SWITCH	
SW19	EVQ11Y05B	SWITCH	
SW20	EVQ11Y05B	SWITCH	
SW21	EVQ11Y05B	SWITCH	
SW22	EVQ11Y05B	SWITCH	
SW23	EVQ11Y05B	SWITCH	
SW24	EVQ11Y05B	SWITCH	
SW25	EVQ11Y05B	SWITCH	
SW26	EVQ11Y05B	SWITCH	
SW27	EVQ11Y05B	SWITCH	
SW28	EVQ11Y05B	SWITCH	
SW30	EVQ11Y05B	SWITCH	
SW31	EVQ11Y05B	SWITCH	
SW41	EVEGB141112B	SWITCH	
SW42	PFSH1A003Z	SWITCH	
		(RESISTORS)	

Ref. No.	Part No.	Part Name & Description	Remarks
J26	PQ4R18XJ103	10k	S
J23	ERJ8GEY0R00	0	
J24	ERJ8GEY0R00	0	
J25	ERJ8GEY0R00	0	
R1	ERJ3GEY0R00	0	
R2	ERJ3GEY0R00	0	
R3	ERJ3GEYJ332	3.3k	
R4	ERJ3GEYJ564	560k	
R5	ERJ3GEYJ223	22k	
R6	ERJ3GEYJ682	6.8k	
R7	ERJ3GEYJ331	330	
R8	ERJ3GEYJ331	330	
R9	ERJ3GEYJ101	100	
R10	ERJ3GEYJ472	4.7k	
R11	ERJ3GEYJ331	330	
R12	ERJ3GEYJ563	56k	
R13	ERJ3GEYJ273	27k	
R14	ERJ3GEYJ561	560	
R16	ERDS1TJ470	47	
R17	ERJ3GEYJ271	270	
R20	ERJ3GEY0R00	0	
R21	ERJ3GEY0R00	0	
R22	ERJ8GEY0R00	0	
R24	ERJ3GEY0R00	0	
R31	ERJ3GEY0R00	0	
R42	ERJ3GEY0R00	0	
		(CAPACITORS)	
C3	ECUV1H104ZFV	0.1	S
C6	ECUV1H104ZFV	0.1	S
C7	ECUV1H331JCV	330P	S
C8	ECUV1H331JCV	330P	S
C9	ECUV1H331JCV	330P	S
C10	ECUV1H681KBV	680P	
C11	ECUV1C104KBV	0.1	
C12	ECUV1H103KBV	0.01	
C14	ECUV1H103KBV	0.01	
C15	ECUV1H104ZFV	0.1	S
C16	ECUV1H104ZFV	0.1	S
C18	ECUV1C224ZFV	0.22	

12.5. POWER SUPPLY BOARD PARTS

Ref. No.	Part No.	Part Name & Description	Remarks
PCB4	PFLP1282MZL	POWER SUPPLY BOARD ASS'Y (RTL)	⚠
		(ICS)	
IC101	PFVIFA5317P	IC	
IC201	AN1431T	IC	
IC202	PFVITA7805F	IC	S
		(TRANSISTORS)	
Q101	2SK2640	TRANSISTOR(SI)	⚠
		(DIODES)	
D101	PFVD1N4005	DIODE(SI)	⚠ S
D102	PFVD1N4005	DIODE(SI)	⚠ S
D103	PFVD1N4005	DIODE(SI)	⚠ S
D104	PFVD1N4005	DIODE(SI)	⚠ S
D105	PFVDAG01A	DIODE(SI)	
D106	MA165	DIODE(SI)	
D107	MA4220	DIODE(SI)	
D108	PQVDERA1802	DIODE(SI)	S
D201	PFVDSF5LC20U	DIODE(SI)	S
D202	PFVDD1NL20U	DIODE(SI)	S
		(COIL)	
L101	ELF15N007A	COIL	⚠
		(COMPONENTS PARTS)	
CN31	PQJP2D98Z	CONNECTOR, 2PIN	⚠
CN301	PQJP7G30Z	CONNECTOR, 7PIN	⚠
		(FUSE)	
F101	PQBA1C50NBKL	FUSE	⚠ S
		(PHOTO ELECTRIC TRANSDUCERS)	
PC101	0N3131SKU	PHOTO ELECTRIC TRANSDUCER	⚠ S
		(TRANSFORMER)	
T101	PFLTSRW2820E	TRANSFORMER	⚠ S
		(VARIABLE RESISTOR)	
VR201	EVNDJAA03B53	VARIABLE RESISTOR	
		(VARISTOR)	
ZNR101	ERZV10DK471U	VARISTOR	⚠
		(RESISTORS)	
R101	ERDS2TJ105	1M	⚠
R102	ERDS2TJ334	330k	
R103	ERDS2TJ334	330k	
R104	ERG1SJ104	100k	
R105	ERX2SJR22	0.22	
R106	ERG2SJ470	47	
R108	ERDS2FJ150	15	
R109	ERDS2TJ220	22	
R121	PQ4R10XJ103	10k	S
R122	ERJ6GEYJ621	620	
R124	PQ4R10XJ181	180	S
R125	PQ4R10XJ103	10k	S
R126	PQ4R10XJ562	5.6k	S
R127	PQ4R10XJ182	1.8k	S
R128	PQ4R10XJ181	180	
R136	PQ4R10XJ393	39k	S
R137	PQ4R10XJ393	39k	S
R202	ERG2SJ152	1.5k	

Ref. No.	Part No.	Part Name & Description	Remarks
R221	PQ4R10XJ222	2.2k	S
R222	PQ4R10XJ222	2.2k	S
R223	PQ4R10XJ101	100	S
R224	PQ4R10XJ273	27k	S
R225	PQ4R10XJ332	3.3k	S
		(CAPACITORS)	
C101	ECQU2A104MV	0.1	⚠
C102	ECQU2A473MG	0.047	⚠
C103	PFKDE2GA102K	0.001	S
C105	PFKDE2GA222M	0.0022	⚠
C106	PFEU200SX180	180	S
C108	ECKD3A102KBP	0.001	
C109	ECA1VHG470	47	
C119	ECKD3A221KBP	220P	
C121	ECUV1H472KBN	0.0047	
C122	ECUV1C224KBX	0.22	
C123	ECUV1H561KBM	560P	
C124	ECUV1H104KBW	0.1	S
C201	PFCEA35F471	470	S
C202	ECKD3A102KBP	0.001	
C203	PFCEA16A470	470	S
C204	PFCEA35A47M	47	S
C205	PFCEA50A1M	1	S

12.6. FIXTURES AND TOOLS

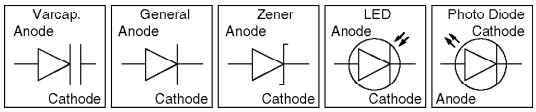
Ref. No.	Part No.	Part Name & Description	Remarks
EC1	PQZZ7K52A-R	CONNECTOR, 7P	
EC2	PFZZ18K2Z	CONNECTOR, 18P	
EC3	PQZZ2K1Z	CONNECTOR, 11P	
EC4	PFZZ5K13Z	CONNECTOR, 5P	
EC5	PFZZ13K2Z	CONNECTOR,13P	
EC6	PFZZ10K4Z	CONNECTOR,10P	
EC7	PQZZ2K12Z	CONNECTOR, 2P	
EC8	PQZZ12K4Z	CONNECTOR, 12P	
EC9	PQZZ2K13Z	CONNECTOR, 2P	
EC10	PFJE1015Z	LEAD WIRE	
EC11	PFJE1005Z	LEAD WIRE	
	KM79811245C0	BASIC FACSIMILE TECHNIQUE	
		(For training service / technicians)	

Notes:
Tools and Extension Cords are useful for servicing. / (They make servicing easy.)

13. FOR THE SCHEMATIC DIAGRAMS

Note:

1. DC voltage measurements are taken with an oscilloscope or a tester with a ground.
2. The schematic diagrams and circuit board may be modified at any time with the development of new technology.



Important safety notice
Components identified by ⚠ mark have special characteristics important for safety. When replacing any of these components, use only the manufacturer's specified parts.

13.1. MEMO

14. PRINTED CIRCUIT BOARD

14.1. DIGITAL BOARD: COMPONENT VIEW

14.2. DIGITAL BOARD: BOTTOM VIEW

14.3. ANALOG BOARD: COMPONENT VIEW

14.4. ANALOG BOARD: BOTTOM VIEW

14.5. OPERATION BOARD

14.6. POWER SUPPLY BOARD

15. SCHEMATIC DIAGRAM

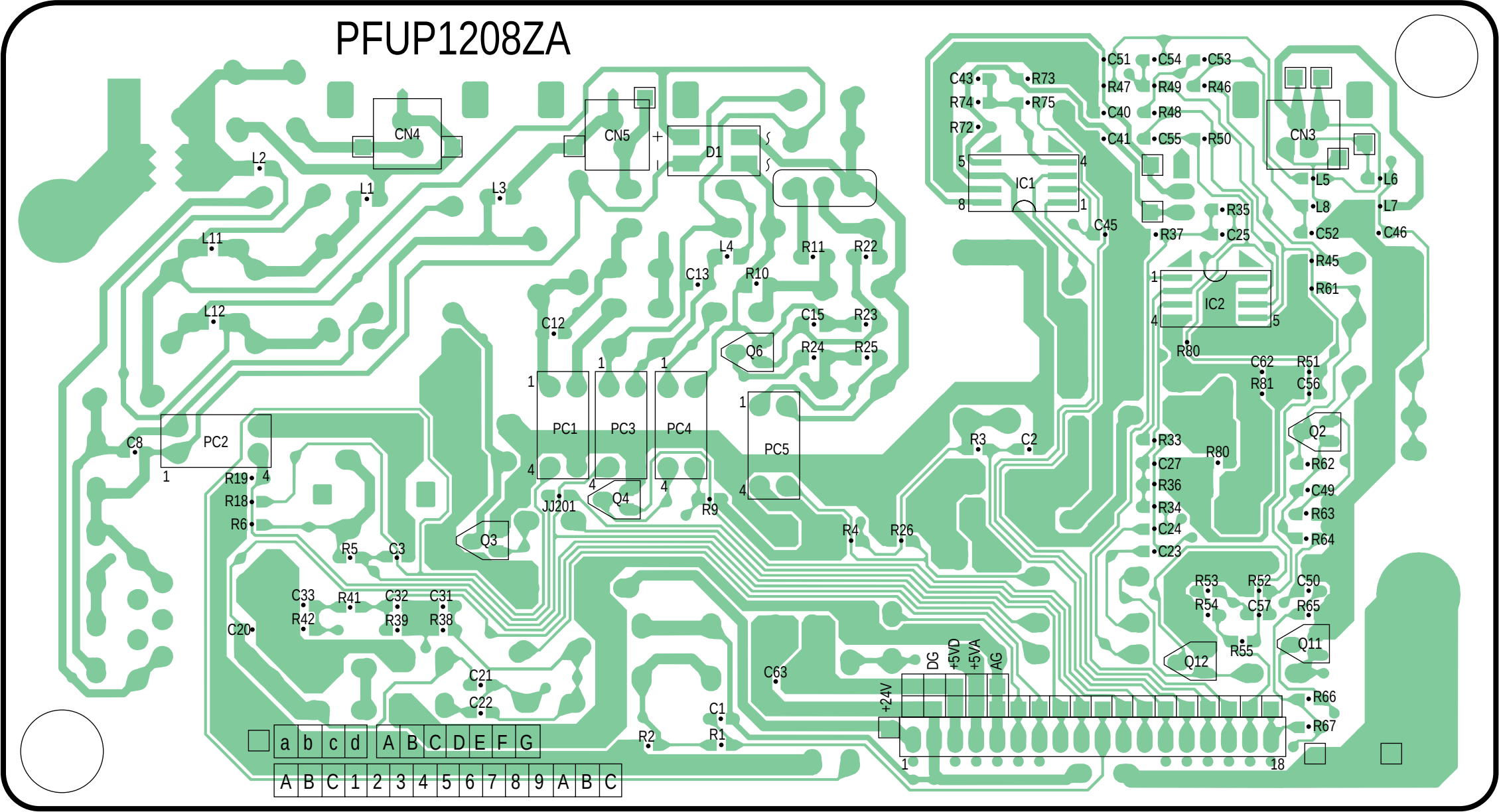
15.1. DIGITAL BOARD

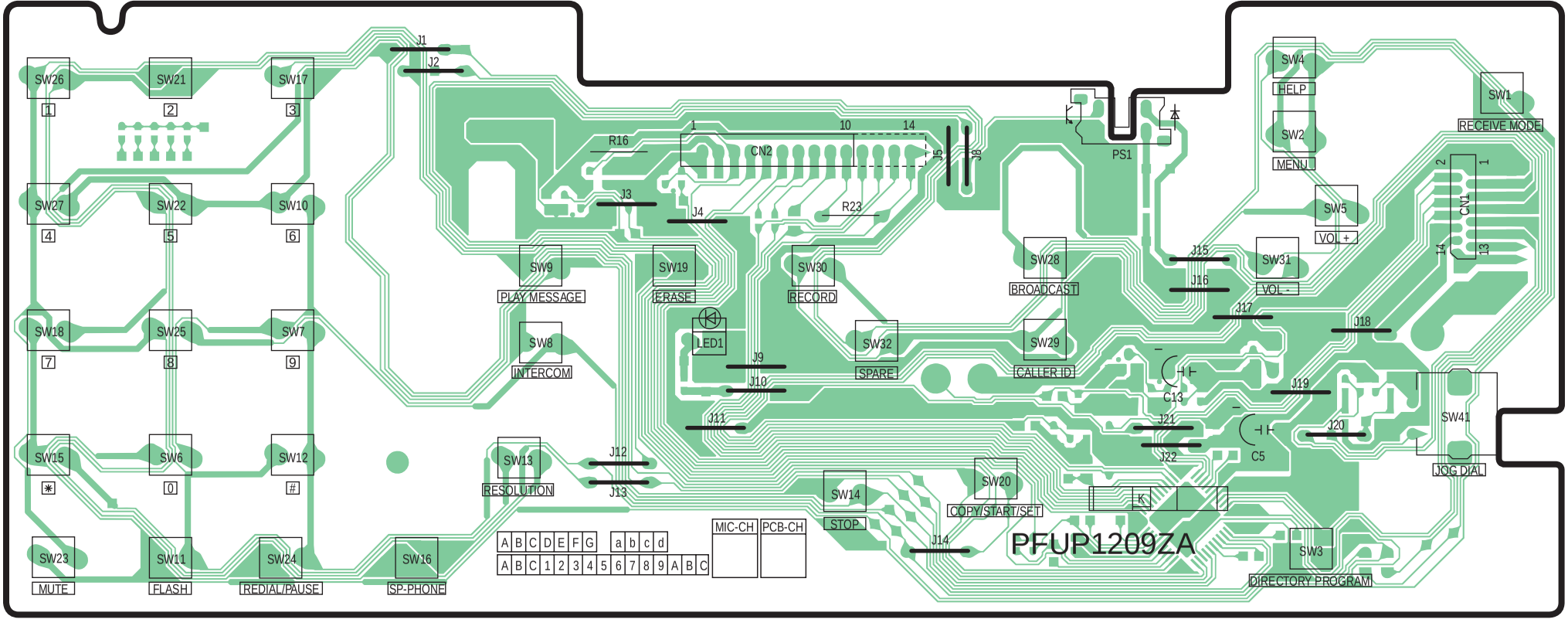
15.2. ANALOG BOARD

15.3. OPERATION BOARD

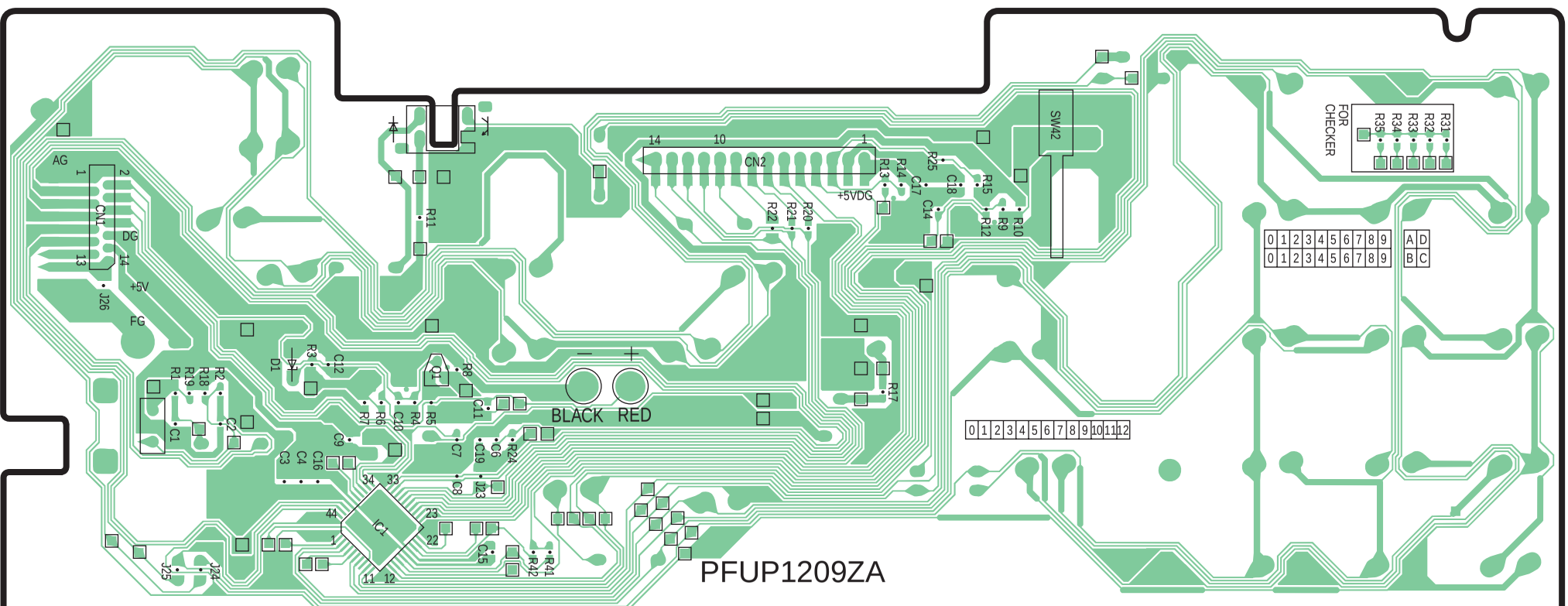
15.4. POWER SUPPLY BOARD

/ Y.M(Q) KXFT68BRP


PFUP1208ZA
CN4
CN5
D1
L1
L2
L3
L4
L11
L12
C12
C13
R10
R11
R22
C15
R23
R24
R25
Q6
PC1
PC2
PC3
PC4
PC5
JJ201
Q4
R9
C8
R19
R18
R6
Q3
R5
C3
C33
R41
C32
C31
R42
R39
R38
C20
C21
C22
C63
C1
R2
R1
R4
R26
R3
C2
IC1
C43
R73
R74
R75
R72
C45
C51
C54
C53
R47
R49
R46
C40
R48
C41
C55
R50
CN3
L5
L6
L8
L7
C52
C46
R35
C25
R37
IC2
R45
R61
R80
C62
R51
R81
C56
Q2
R62
C49
R63
R64
R33
R80
C27
R36
R34
C24
C23
R53
R52
C50
R54
C57
R65
R55
Q11
Q12
R66
R67
+24V
DG
+5VD
+5VA
AG
1
18
a b c d A B C D E F G
A B C 1 2 3 4 5 6 7 8 9 A B C

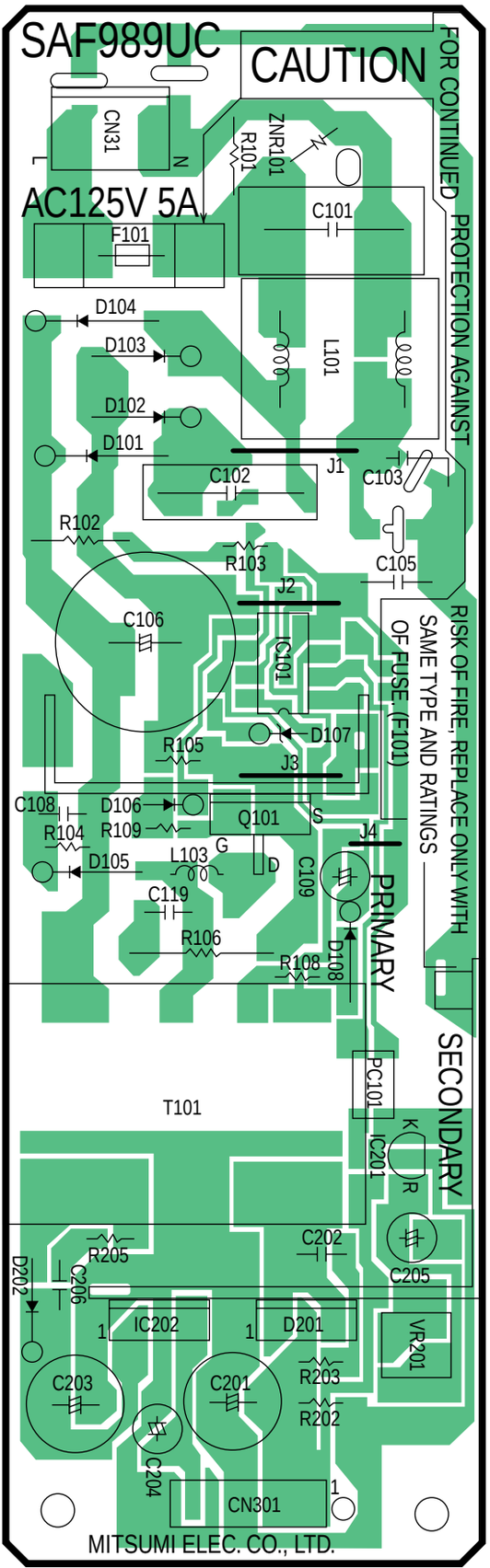


(COMPONENT VIEW)

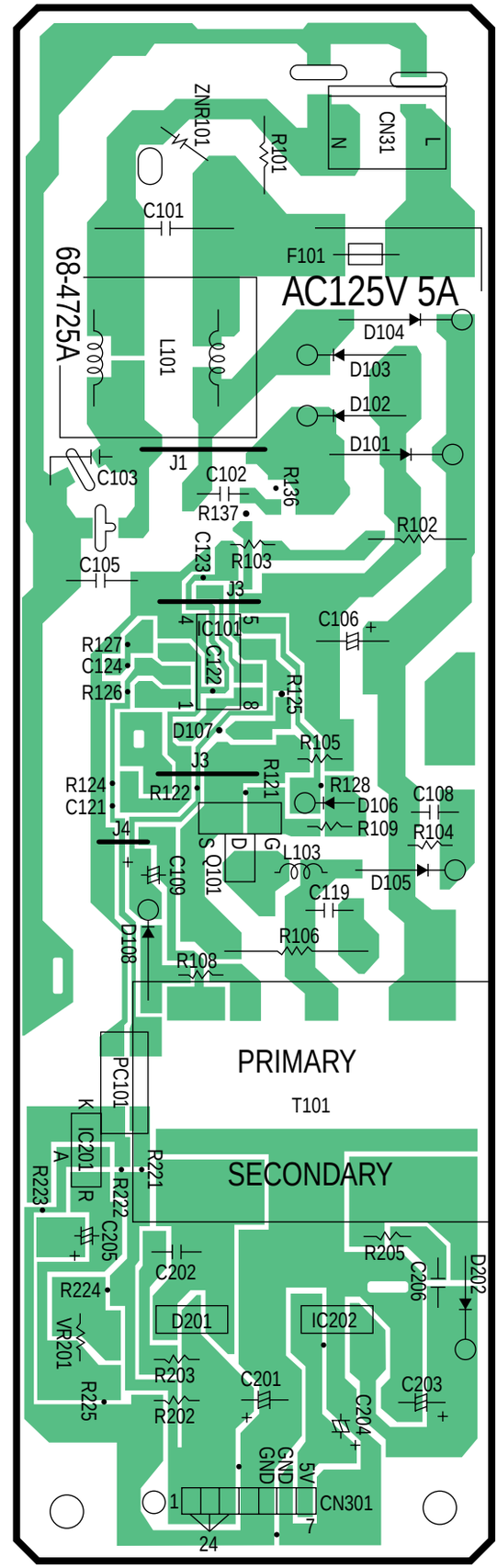


(BOTTOM VIEW)

(COMPONENT VIEW)



(BOTTOM VIEW)



FAX TX

FAX RX

T5

T4

T3

T2

T0

TO MOTOR

MOTOR ON: 5V
OFF: 0V

PRINTING
23~24V

PRINTING 5V

TO THERMAL HEAD

STB1

STB2

STB3

LATCH
5V
0V

WATCHDOG ERROR
5V (NORMAL)

0V (WATCH DOG
ERROR OCCUR)

5V
0V
CLOCK

5V
0V
DATA

ROM

SRAM

FLASH

TO POWER SUPPLY UNIT

IC1
ASIC

24MHz

32.768kHz

32.256MHz

MODEM

THERMAL
HEAD TEMP

CIS LED ARRAY
ON: 5V
OFF: 0V

MOTOR
POSITION
SENSOR

CUTTOR
POSITION
SENSOR

TO IMAGE SENSOR

FAX TX

FAX
RX

FAX TX
FAX RX

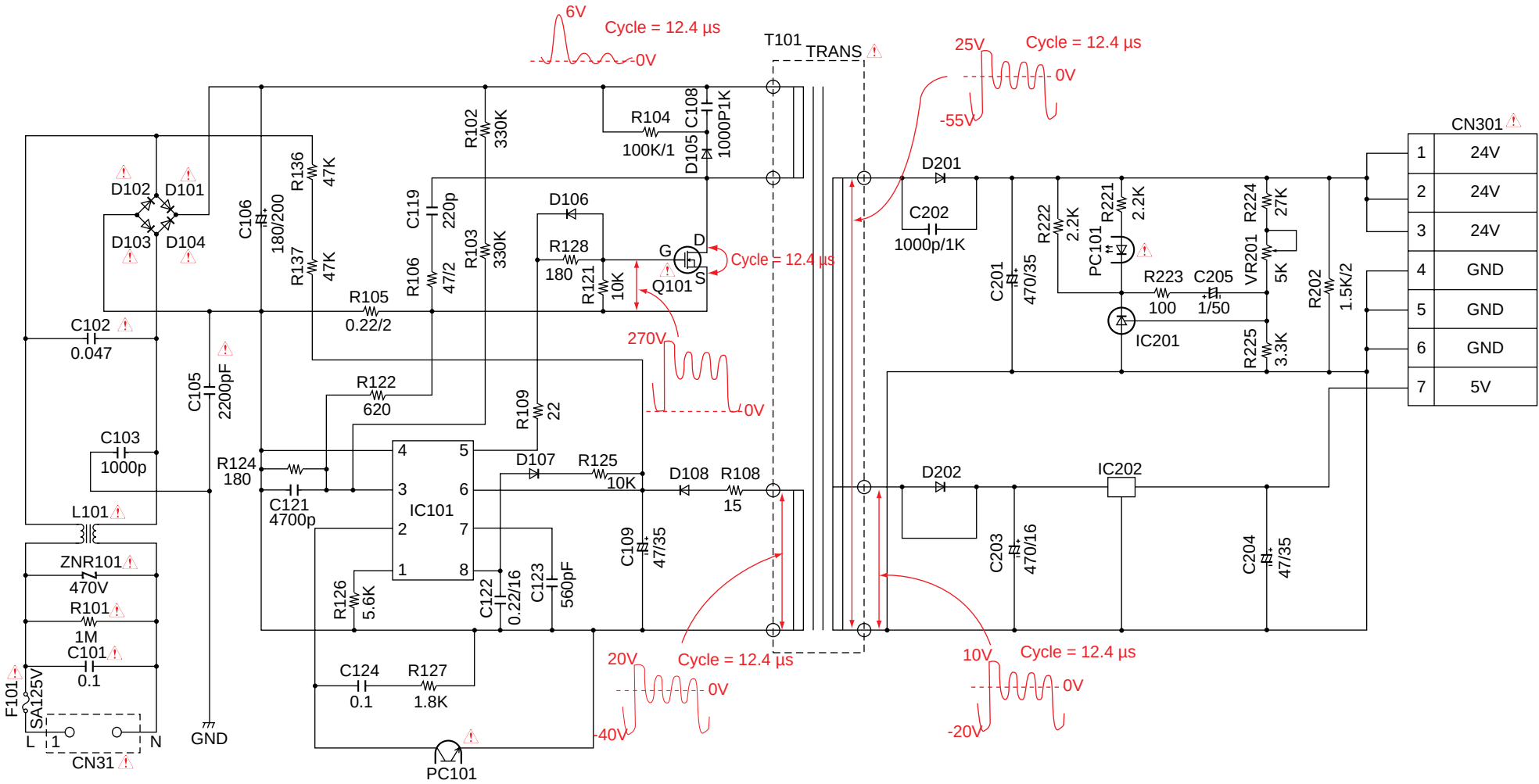
+2V
FAX RX
FAX TX
+12V
BELL DETECT
5V
0V
CPC DETECT
5V
0V
LINE ON/OFF, DIALPULSE
5V
0V
2.1V
2V
2.5V
JAM SW
NO PAPER: 5V
PAPER: 0V
PEPAR SW
NO PAPER: 5V
PAPER: 0V
HOOK SW
ON-HOOK: 5V
OFF-HOOK: 0V
TO SPEAKER

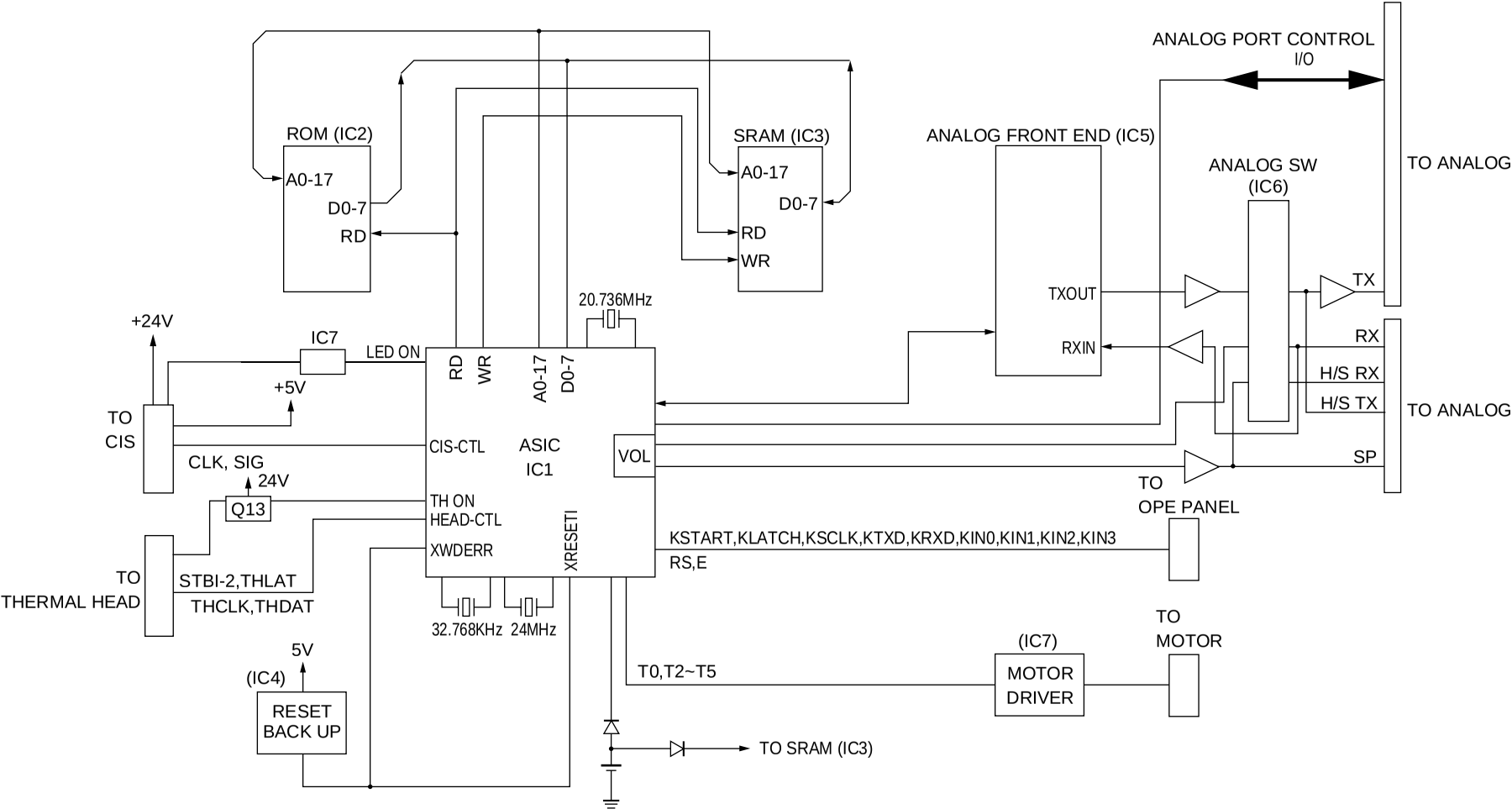
CN1
+24V 1
DG 2
+5VD 3
+5VA 4
AG 5
BELL 6
LINETX 7
CPC 8
RLY 9
PAPER 10
JAM 11
P-SHORT 12
HOOK 13
SPMUTE 14
SPOUT 15
LINERX 16
H/STX 17
H/SRX 18

CN2 1 2
CN3 [0] 1 HSMIC(-) 3 HSSP(+) 2 HSSP(-) 4 HSMIC(+)
CN4 4 a 3 b
CN5 4 3 NC

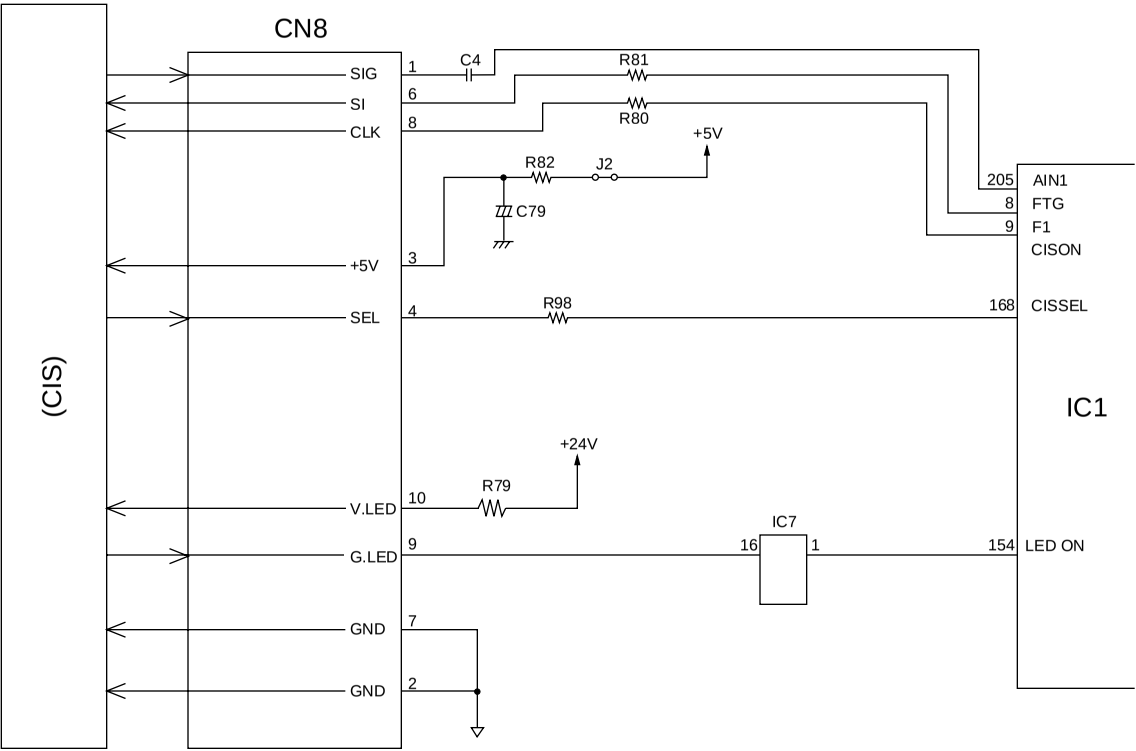
IC1 CD VD2 FC2 GND FC1 VCC VIN V01
IC2 -1
IC2 -2

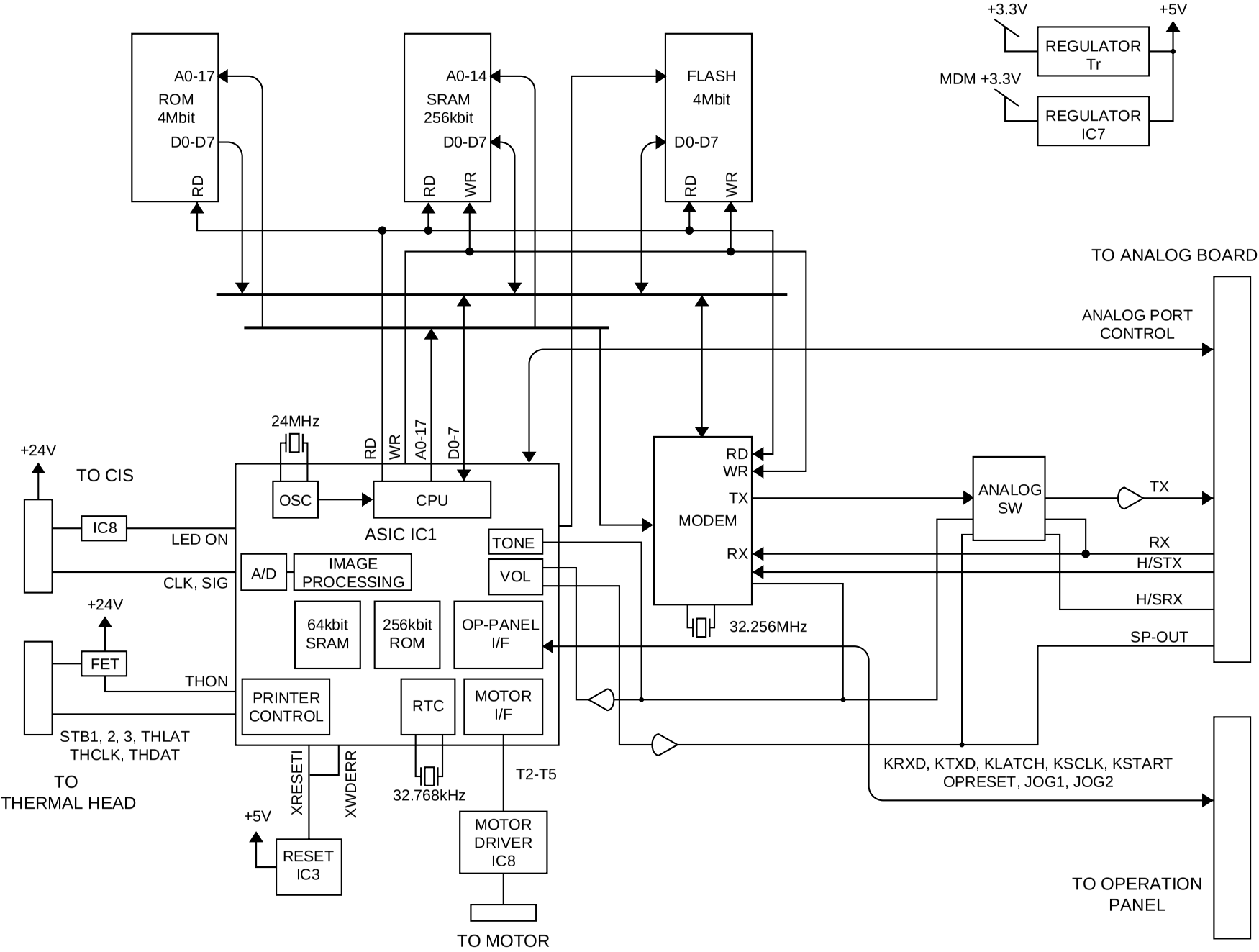
PC1 PC2 PC3 PC4 PC5
Q2 Q3 Q4 Q5 Q6 Q11 Q12
T1 T2
RLY1 -1
ZNR1
SA1 310V
SA2 1000V
POS1
D1 D2 D3 D4 D6 D8 D9 D11 D12 D13 D14
L1 L2 L3 L4 L5 L6 L7 L8 L10 L11 L12
J1 J2
SW1 SW2 SW3


6V
Cycle = 12.4 µs
0V
T101
TRANS
25V
Cycle = 12.4 µs
0V
-55V
CN301
1 24V
2 24V
3 24V
4 GND
5 GND
6 GND
7 5V
D102
D101
D103
D104
C106
180/200
R136
47K
R137
47K
C119
220p
R106
47/2
R102
330K
R103
330K
R104
100K/1
C108
1000P1K
D105
D106
R128
180
R121
10K
G
D
S
Q101
Cycle = 12.4 µs
R105
0.22/2
C102
0.047
C105
2200pF
270V
0V
R122
620
R109
22
C103
1000p
R124
180
C121
4700p
IC101
D107
R125
10K
D108
R108
15
L101
ZNR101
470V
R101
1M
C101
0.1
F101
SA125V
L
1
N
CN31
GND
R126
5.6K
C122
0.22/16
C123
560pF
C109
47/35
C124
0.1
R127
1.8K
PC101
20V
Cycle = 12.4 µs
0V
-40V
D201
C202
1000p/1K
C201
470/35
R222
2.2K
PC101
R221
2.2K
R223
100
C205
1/50
IC201
R224
27K
VR201
5K
R225
3.3K
R202
1.5K/2
D202
IC202
C203
470/16
C204
47/35
10V
Cycle = 12.4 µs
0V
-20V

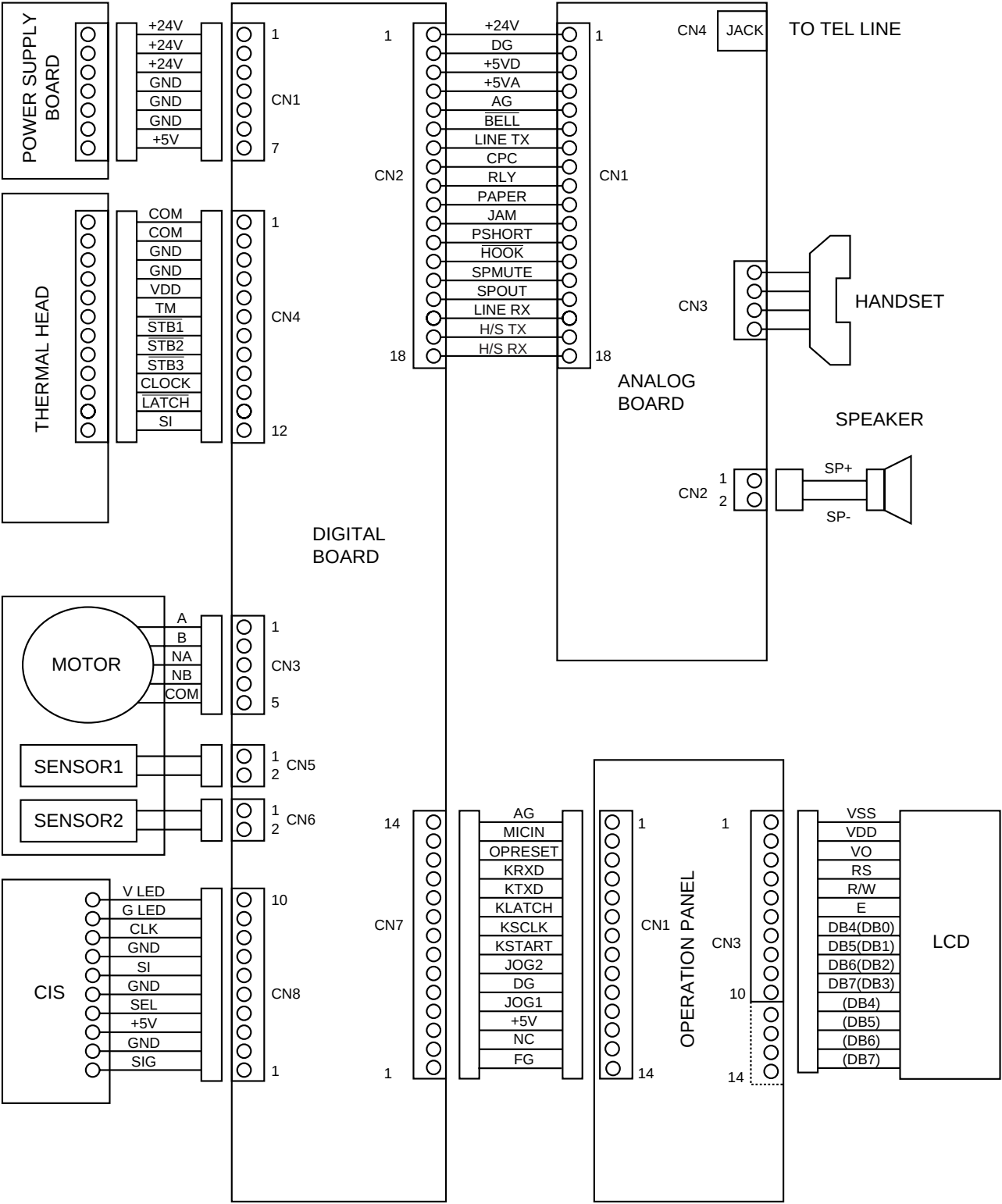

ROM (IC2)
A0-17
D0-7
RD
SRAM (IC3)
A0-17
D0-7
RD
WR
ANALOG PORT CONTROL
I/O
ANALOG FRONT END (IC5)
ANALOG SW
(IC6)
TO ANALOG
TXOUT
RXIN
TX
RX
H/S RX
H/S TX
SP
TO ANALOG
20.736MHz
+24V
IC7
LED ON
+5V
RD
WR
A0-17
D0-7
TO
CIS
CIS-CTL
ASIC
IC1
VOL
CLK, SIG
24V
Q13
TH ON
HEAD-CTL
XWDERR
XRESETI
TO
OPE PANEL
KSTART,KLATCH,KSCLK,KTXD,KRXD,KIN0,KIN1,KIN2,KIN3
RS,E
TO
THERMAL HEAD
STBI-2,THLAT
THCLK,THDAT
32.768KHz
24MHz
TO
MOTOR
(IC7)
5V
(IC4)
RESET
BACK UP
T0,T2~T5
MOTOR
DRIVER
TO SRAM (IC3)

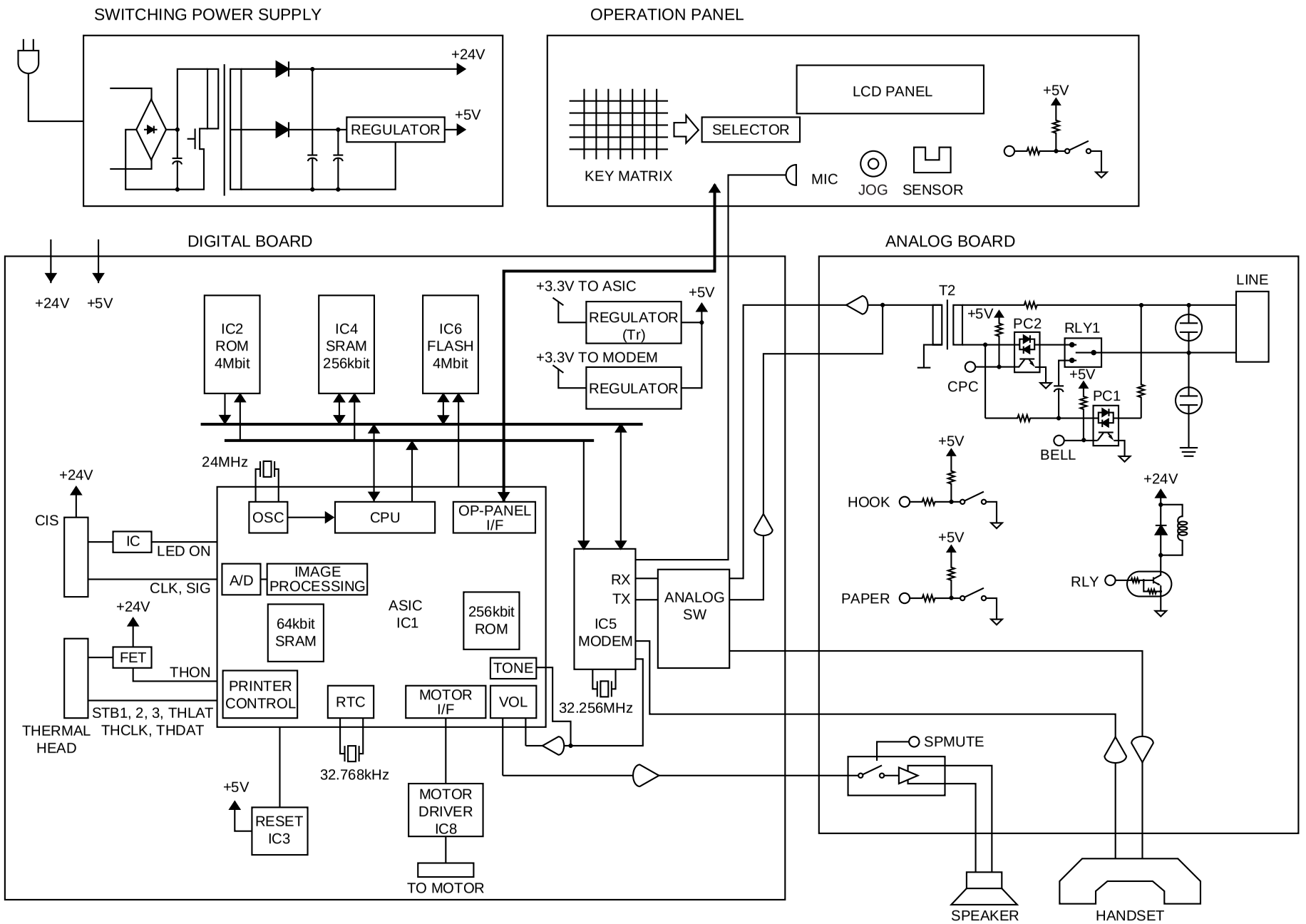
Circuit Diagram

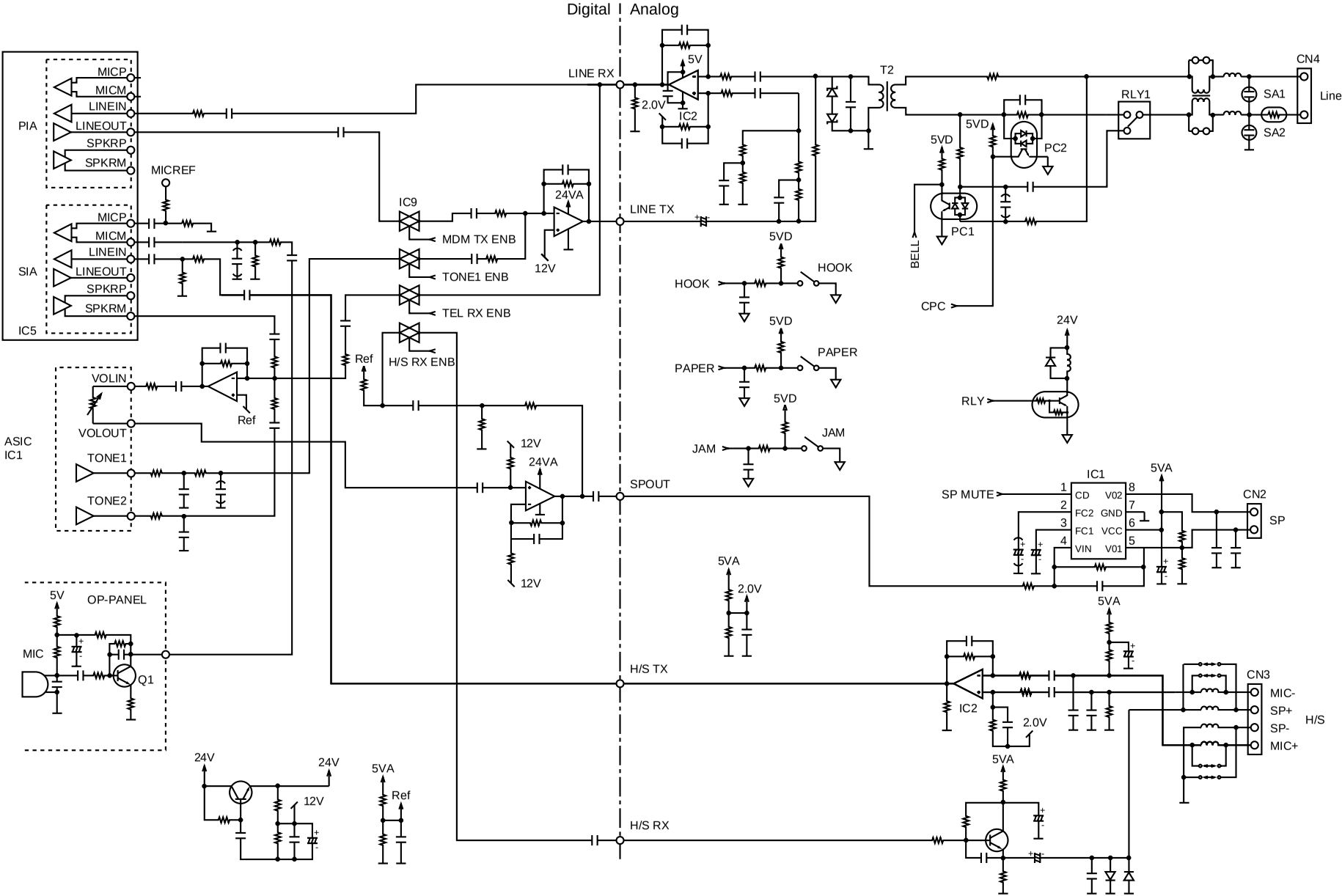


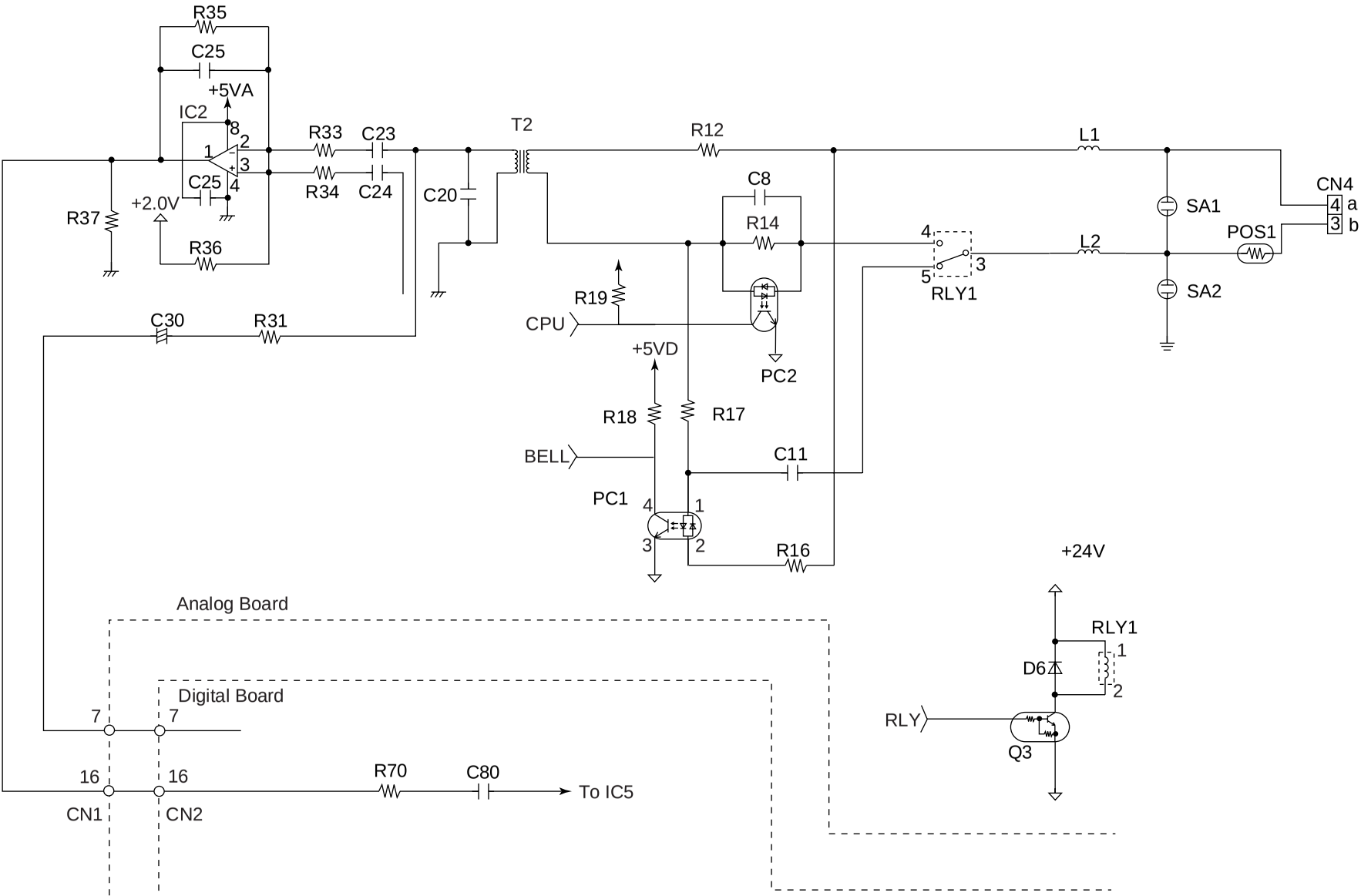

+3.3V
+5V
REGULATOR Tr
MDM +3.3V
REGULATOR IC7
A0-17
ROM 4Mbit
D0-D7
RD
A0-14
SRAM 256kbit
D0-D7
RD
WR
FLASH 4Mbit
D0-D7
RD
WR
TO ANALOG BOARD
ANALOG PORT CONTROL
24MHz
RD
WR
A0-17
D0-7
+24V
TO CIS
IC8
LED ON
CLK, SIG
OSC
CPU
ASIC IC1
A/D
IMAGE PROCESSING
TONE
VOL
64kbit SRAM
256kbit ROM
OP-PANEL I/F
RD
WR
TX
MODEM
RX
32.256MHz
ANALOG SW
TX
RX
H/STX
H/SRX
SP-OUT
+24V
FET
THON
PRINTER CONTROL
RTC
MOTOR I/F
STB1, 2, 3, THLAT
THCLK, THDAT
TO THERMAL HEAD
XRESETI
XWDERR
32.768kHz
T2-T5
KRXD, KTXD, KLATCH, KSCLK, KSTART
OPRESET, JOG1, JOG2
+5V
RESET IC3
MOTOR DRIVER IC8
TO MOTOR
TO OPERATION PANEL

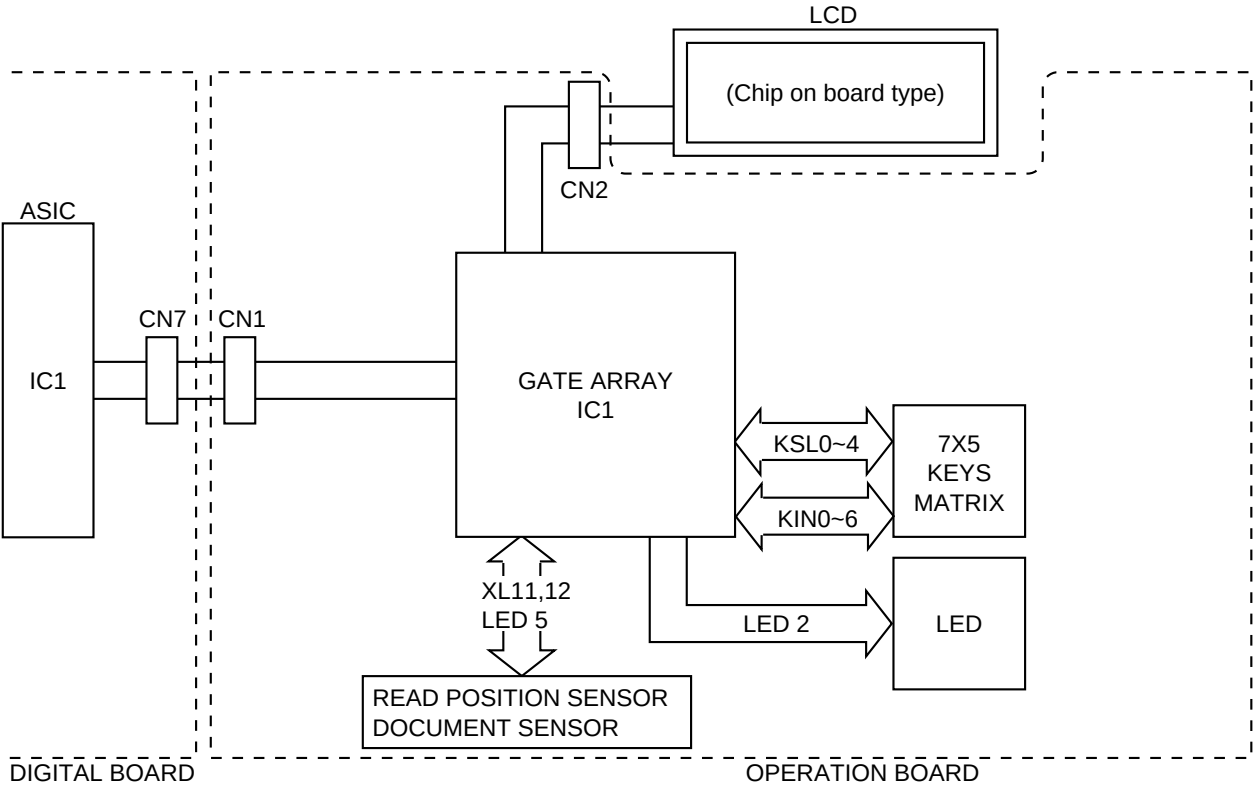
TO DIGITAL
CN1
AG 1
MICIN 2
OPRESET 3
KTXD 4
KRXD 5
KLATCH 6
KSCLK 7
KSTART 8
JOG2 9
DG 10
JOG1 11
+5V 12
NC 13
FG 14
5V
0V
5V
0V
R1 0
R2 0
R18 NC
R19 NC
C1 NC
C2 NC
C3 Z0.1u
C4 NC
C5 6.3V 220u
SW41
JOG DIAL
3 JOG1
2 GND
1 JOG2
C6 Z0.1u
C7 K330p
C8 K330p
C9 K330p
RECEIVE MODE SW1
0 SW6
FLASH SW11
* SW15
7 SW18
MUTE SW23
BROADCAST SW28
MENU SW2
9 SW7
SW12
ERASE SW19
REDIAL/PAUSE SW24
CALLER ID SW29
DIRECTORY PROGRAM SW3
INTERCOM SW8
COPY/START/SET SW20
8 SW25
RECORD SW30
HELP SW4
PLAY MESSAGES SW9
RESOLUTION SW13
SP-PHONE SW16
2 SW21
1 SW26
VOL - SW31
VOL + SW5
6 SW10
STOP SW14
3 SW17
5 SW22
4 SW27
SPARE SW32
IC1
30 RESET
31 SCLK
32 RXD
33 TXD
34 LATCH
35 START
42 KIN0
3 KIN1
7 KIN2
8 KIN3
11 KIN4
12 KIN5
13 KIN6
14 KIN7
43 KSL0
44 KSL1
1 KSL2
10 KSL3
4 KSL4
9 XL10
18 GND
39 GND
17 VDD
40 VDD
2
22 LED6
23 LED1
24 RS
25 R/W
26 E
27 D4
28 D5
29 D6
36 D7
37 LED2
38 LED3
41 LED4
5 LED5
6 XL8
15 XL9
16 XL12
19 XL11
20 XL13
21 XL14
XL15
R24 0
C19 NC
C15 Z0.1u
C16 Z0.1u
5V
0V
R41 NC
R42 0
R15 NC
R14 560
LCD CONTRAST
R13 [4] 27K
R16 47(1/2W)
R25 NC
C17 NC
C18 Z0.22u
TO LCD
CN2
1 GND
2 +5V
3 V0
4 RS
5 R/W
6 E
7 D0
8 D1
9 D2
10 D3
11 D4
12 D5
13 D6
14 D7
R20 0
R21 0
R22 0
R23 0
5V
0V
R17 270
LED1
NEW MESSAGE
LED ON : 5V
OFF : 0V
NO PAPER 5V
PAPER 5V
0V
NO PAPER 5V
PAPER 0V
R10 4.7K
R9 100
C14 K0.01
SW42
DOCUMENT TOP SW
R12 56K
R11 330
DOCUMENT SET SW
PS1
5V
0V
R31 0
R32 NC
R33 NC
R34 NC
R35 NC
J1 0
J2 0
J3 0
J4 0
J5 0
J11 0
J12 0
J8 0
J9 0
J10 0
J16 0
J17 0
J13 0
J14 0
J15 0
J21 0
J22 0
J18 0
J19 0
J20 0
J26 10K
J23 0
J24 0
J25 0
+2.5V
R7 330
R3 3.3K
C10 K680P
R4 560K
R6 6.8K
C13 6.3V 47u
Q1
R5 22K
C11 K0.1u
C12 K0.01u
D1
R8 330
TO MIC
MIC(+)
MIC(-)

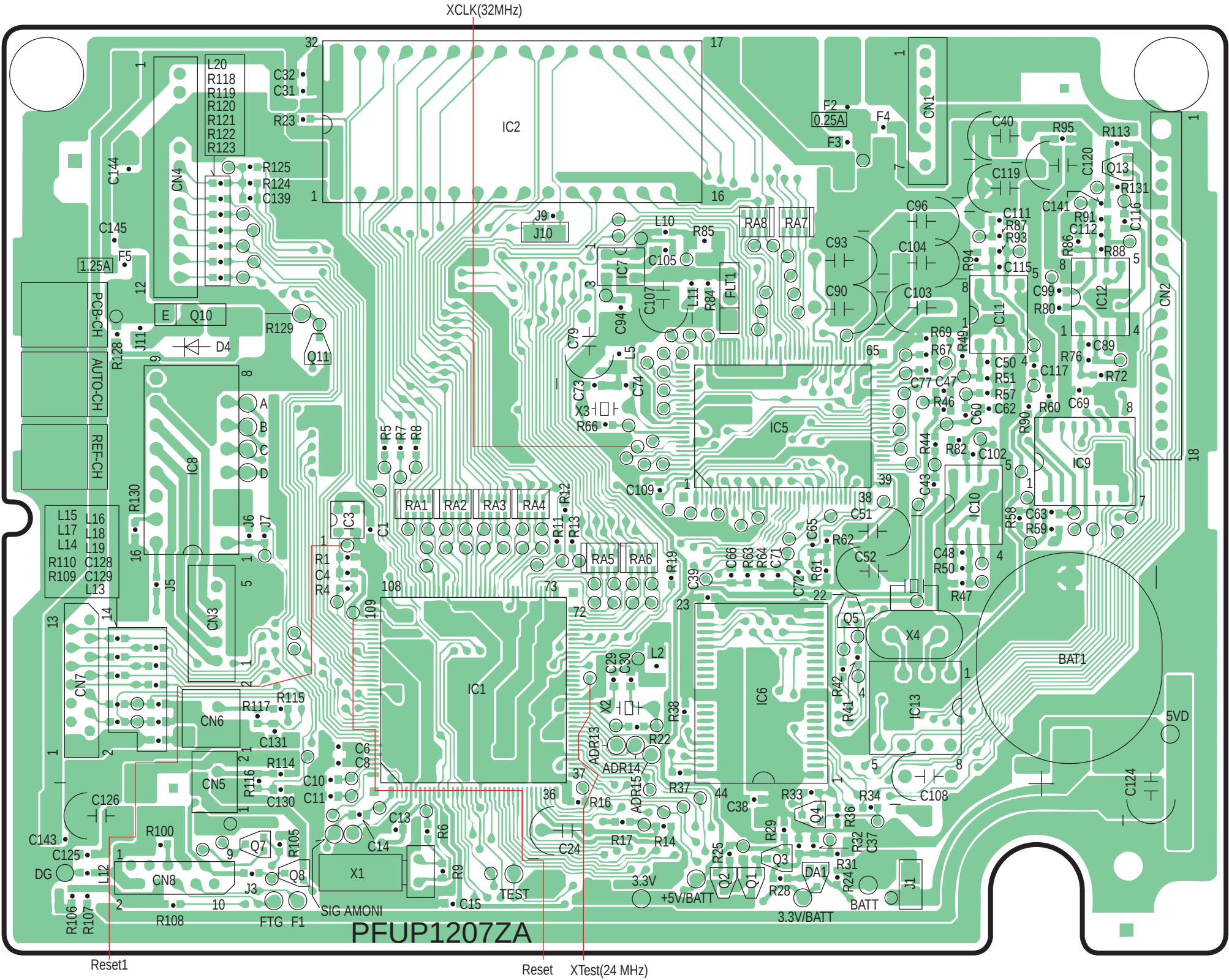

POWER SUPPLY BOARD
+24V
+24V
+24V
GND
GND
GND
+5V
1
CN1
7
THERMAL HEAD
COM
COM
GND
GND
VDD
TM
STB1
STB2
STB3
CLOCK
LATCH
SI
1
CN4
12
DIGITAL BOARD
1
+24V
DG
+5VD
+5VA
AG
BELL
LINE TX
CPC
RLY
PAPER
JAM
PSHORT
HOOK
SPMUTE
SPOUT
LINE RX
H/S TX
H/S RX
18
CN2
1
CN1
18
ANALOG BOARD
CN4
JACK
TO TEL LINE
CN3
HANDSET
SPEAKER
CN2
1
2
SP+
SP-
MOTOR
A
B
NA
NB
COM
1
CN3
5
SENSOR1
1
2
CN5
SENSOR2
1
2
CN6
CIS
V LED
G LED
CLK
GND
SI
GND
SEL
+5V
GND
SIG
10
CN8
1
14
CN7
1
AG
MICIN
OPRESET
KRXD
KTXD
KLATCH
KSCLK
KSTART
JOG2
DG
JOG1
+5V
NC
FG
OPERATION PANEL
1
CN1
14
1
CN3
10
14
VSS
VDD
VO
RS
R/W
E
DB4(DB0)
DB5(DB1)
DB6(DB2)
DB7(DB3)
(DB4)
(DB5)
(DB6)
(DB7)
LCD

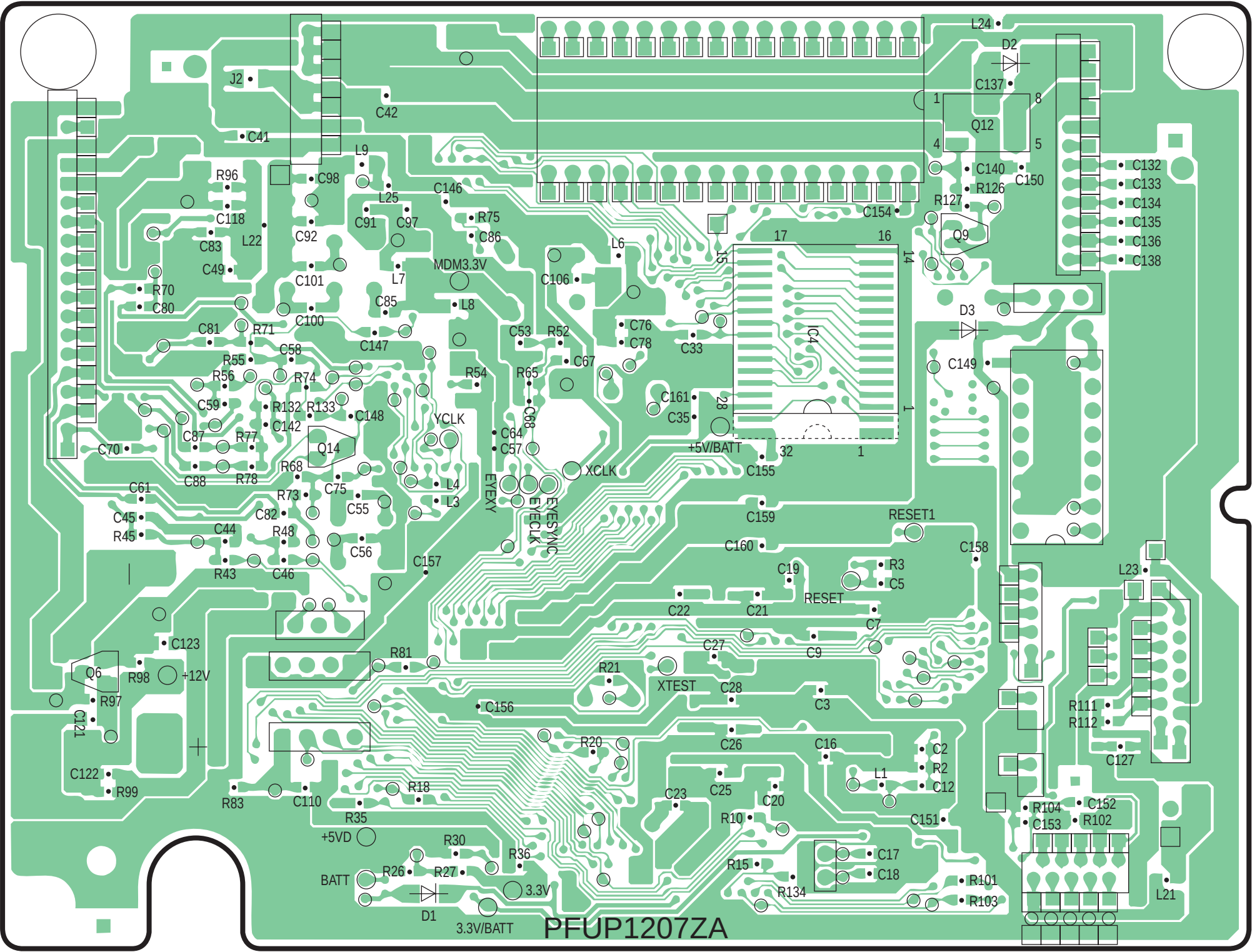

SWITCHING POWER SUPPLY
+24V
+5V
REGULATOR
OPERATION PANEL
LCD PANEL
SELECTOR
KEY MATRIX
MIC
JOG
SENSOR
+5V
DIGITAL BOARD
ANALOG BOARD
+24V
+5V
IC2
ROM
4Mbit
IC4
SRAM
256kbit
IC6
FLASH
4Mbit
+3.3V TO ASIC
REGULATOR
(Tr)
+3.3V TO MODEM
REGULATOR
24MHz
OSC
CPU
OP-PANEL
I/F
CIS
IC
LED ON
CLK, SIG
A/D
IMAGE
PROCESSING
ASIC
IC1
64kbit
SRAM
256kbit
ROM
FET
THON
PRINTER
CONTROL
STB1, 2, 3, THLAT
THCLK, THDAT
THERMAL
HEAD
RTC
32.768kHz
MOTOR
I/F
VOL
TONE
RX
TX
IC5
MODEM
32.256MHz
ANALOG
SW
RESET
IC3
MOTOR
DRIVER
IC8
TO MOTOR
T2
LINE
CPC
PC2
RLY1
PC1
BELL
HOOK
PAPER
RLY
SPMUTE
SPEAKER
HANDSET

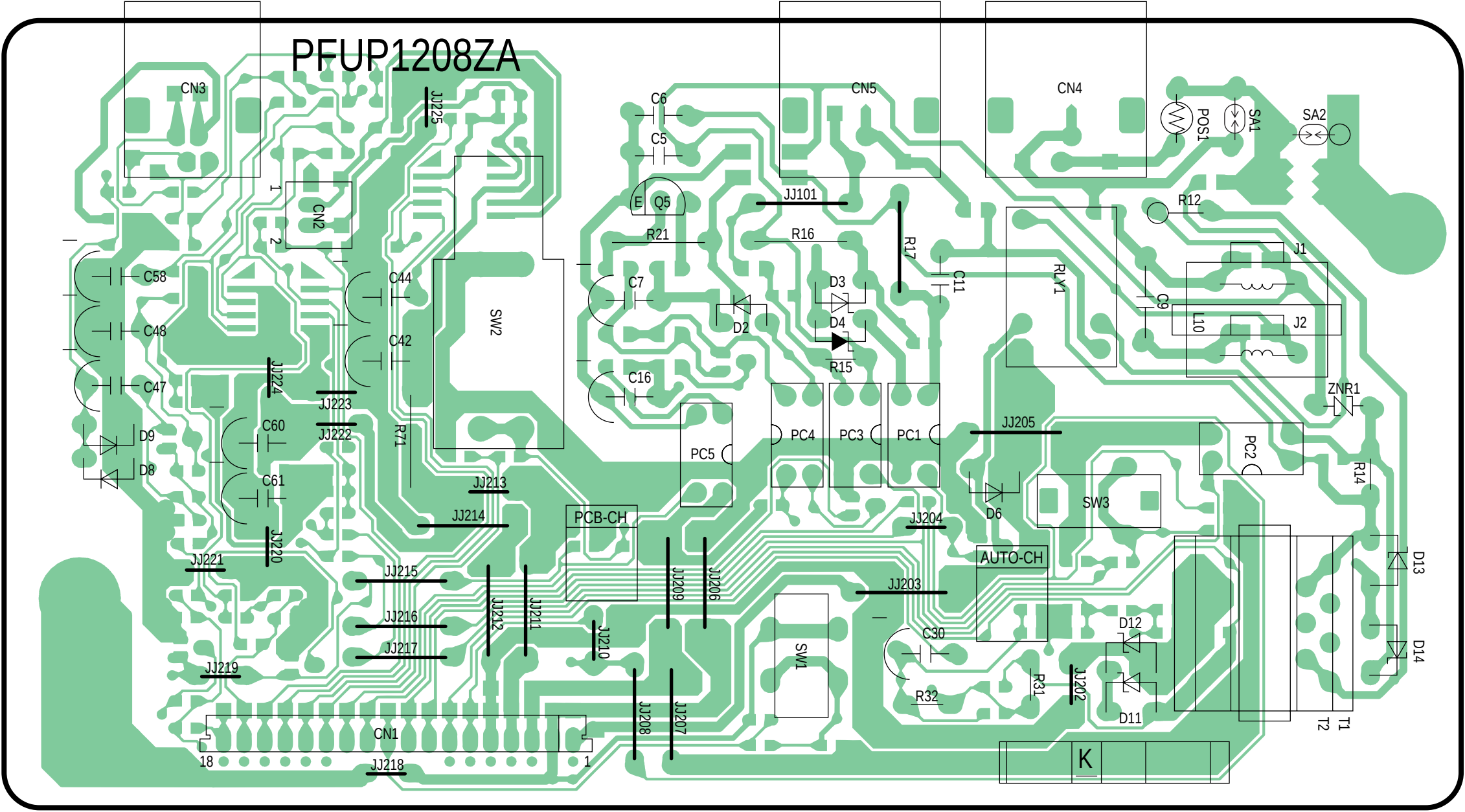

Digital
Analog
PIA
MICP
MICM
LINEIN
LINEOUT
SPKRP
SPKRM
SIA
IC5
MICREF
LINE RX
LINE TX
5V
2.0V
IC2
T2
CN4
Line
SA1
SA2
RLY1
PC2
PC1
BELL
CPC
IC9
MDM TX ENB
TONE1 ENB
TEL RX ENB
H/S RX ENB
24VA
12V
Ref
HOOK
PAPER
JAM
RLY
24V
ASIC
IC1
VOLIN
VOLOUT
TONE1
TONE2
SPOUT
IC1
SP MUTE
CD
FC2
FC1
VIN
V02
GND
VCC
V01
CN2
SP
5VA
OP-PANEL
MIC
Q1
H/S TX
H/S RX
CN3
MIC-
SP+
SP-
MIC+
H/S


R35
C25
+5VA
IC2
R33
C23
T2
R12
L1
CN4
4 a
3 b
SA1
POS1
C8
R14
L2
SA2
R37
+2.0V
C25
R34
C24
C20
R36
4
5
3
RLY1
C30
R31
R19
CPU
+5VD
PC2
R18
R17
BELL
C11
PC1
4
1
3
2
R16
+24V
Analog Board
RLY1
1
D6
2
Digital Board
7
7
RLY
Q3
16
16
R70
C80
To IC5
CN1
CN2


LCD
(Chip on board type)
CN2
ASIC
IC1
CN7
CN1
GATE ARRAY
IC1
KSL0~4
KIN0~6
7X5
KEYS
MATRIX
XL11,12
LED 5
LED 2
LED
READ POSITION SENSOR
DOCUMENT SENSOR
DIGITAL BOARD
OPERATION BOARD


XCLK(32MHz)
PFUP1207ZA
Reset1
Reset
XTest(24 MHz)
IC1
IC2
IC3
IC5
IC6
IC7
IC8
IC9
IC10
IC12
IC13
CN1
CN2
CN3
CN4
CN5
CN6
CN7
CN8
Q1
Q2
Q3
Q4
Q5
Q7
Q8
Q10
Q11
Q13
D4
X1
X2
X3
X4
BAT1
DA1
J1
J3
J9
J10
J11
F1
F2
F3
F4
F5
0.25A
1.25A
FLT1
RA1
RA2
RA3
RA4
RA5
RA6
RA7
RA8
PCB-CH
AUTO-CH
REF-CH
3.3V
+5V/BATT
3.3V/BATT
BATT
5VD
TEST
SIG AMONI
FTG
DG


J2
C42
C41
L9
R96
C98
L25
C146
C118
C91
C97
R75
C83
L22
C92
C86
C49
MDM3.3V
L7
C101
C106
L6
R70
C80
C85
L8
C81
R71
C100
C53
R52
C76
C78
C33
C147
C58
C67
R55
R56
R74
R54
R65
C59
R132
R133
C148
C68
C161
C35
C87
R77
C142
YCLK
C64
C57
C70
Q14
+5V/BATT
C155
R68
XCLK
C88
R78
C75
L4
EYEXY
C61
R73
C55
L3
EYESYNC
EYECLK
C45
C82
C159
RESET1
R45
C44
R48
C160
C158
C56
C19
R3
C157
C5
C43
C46
C22
C21
RESET
C7
C123
C27
C9
R81
R21
XTEST
C28
C3
Q6
R98
+12V
C156
R97
C121
R20
C26
C16
C2
C122
R99
C23
C25
C20
R2
L1
C12
R83
C110
R18
R10
C151
R35
+5VD
R30
R36
C17
R15
C18
BATT
R26
R27
R134
R101
3.3V
R103
D1
3.3V/BATT
L24
D2
C137
Q12
C140
C150
R126
R127
C154
Q9
C132
C133
C134
C135
C136
C138
D3
C149
L23
R111
R112
C127
R104
C152
C153
R102
L21
PFUP1207ZA


PFUP1208ZA
CN3
CN5
CN4
POS1
SA1
SA2
JJ225
CN2
C6
C5
E
Q5
JJ101
R12
J1
R21
R16
R17
C11
RLY1
C58
C44
C7
D3
C9
L10
J2
C48
C42
SW2
D2
D4
C16
R15
ZNR1
C47
JJ224
JJ223
JJ222
C60
R71
PC5
PC4
PC3
PC1
JJ205
PC2
R14
D9
D8
C61
JJ213
JJ214
PCB-CH
JJ204
D6
SW3
JJ221
JJ220
JJ215
JJ216
JJ217
JJ212
JJ211
JJ209
JJ206
AUTO-CH
JJ203
D13
D14
D12
C30
JJ219
JJ210
SW1
R31
JJ202
R32
D11
T1
T2
CN1
JJ208
JJ207
18
1
JJ218
K